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Marketing Research Report No. 403

NONFAT DRY MILK PACKAGED FOR HOUSEHOLD USE

**MARKETING PRACTICES
AND COSTS OF
MANUFACTURE AND DISTRIBUTION**

U.S. DEPARTMENT OF AGRICULTURE

Agricultural Marketing Service

Marketing Economics Research Division

Washington, D.C

PREFACE

This report on the manufacture and distribution of nonfat dry milk for home use is one of a group of reports issued by the Marketing Economics Research Division, Agricultural Marketing Service, to meet, in part, the need for information on farm-to-retail price spreads on food. This study is part of a broad program of research to increase the efficiency of marketing farm products.

The report describes the growth and some of the problems of the dry milk industry, and outlines briefly some salient facts about instant nonfat dry milk, a fast-growing consumer product. It also describes the marketing practices of manufacturers and distributors, and estimates the costs of the various marketing processes, and variations in these costs, in getting dry milk from producer to consumer. Farm-to-retail price spreads over a 3-year period are also estimated.

Information was supplied by manufacturers and wholesalers of nonfat dry milk for home use, by manufacturers of packaging materials used by the industry, and by persons both within and outside the Department familiar with the dry milk industry and with food marketing.

June 1960

:	:	
:	:	
:	"Farm-to-retail price spread"	:
:	:	:
:	The difference between the price that consumers	:
:	pay for 1 pound of instant nonfat dry milk and	:
:	the payment that the farmer receives for an	:
:	equivalent quantity (11 pounds) of skim milk is	:
:	the "price spread." It includes all charges for	:
:	manufacturing, instantizing, packaging, selling,	:
:	transporting, and distributing.	:
:	:	:

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SUMMARY

For supplying the raw material (skim milk), the farmer received 15 cents of every dollar consumers spent at retail for instant nonfat dry milk in December 1958. The processor received 14 cents, and the share going for instantizing--a process that causes the product to dissolve easily--and packaging, and for distributing to wholesalers and others was 48 cents. For their marketing services, wholesalers received 5 cents and retailers 18 cents of every dollar spent by consumers for the product.

Although nonfat dry milk has been produced by dairy plants in the United States for many years, sale of the product in retail packages is a relatively recent innovation in dairy marketing. Introduced in the early 1930's, it was not until well after the end of World War II that quality had been improved to the point of overcoming consumer aversion to dehydrated foods, and the product had become acceptable to the American housewife. Since 1954, nonfat dry milk has been sold at retail in an instant or quick-dissolving form.

Sales of nonfat dry milk for home use increased from a little over 2 million pounds in 1948 to 30 million pounds in 1950, and to an estimated 169 million pounds in 1958. Despite rapid growth in sales, however, consumption of nonfat dry milk for home use in 1958 was at the rate of less than 1 pound per capita--out of a total use per capita for food of about 5 pounds--low in comparison with that for such other dairy products as butter, ice cream, and evaporated milk.

Some nonfat dry milk for home use is distributed by firms which perform the entire manufacturing-instantizing-packaging operation. Some of these firms, generally the small independents, package the product under their own labels and distribute it through wholesalers or brokers. Others, principally cooperatives, package under the labels of chainstores or other food distributors.

The greater proportion of the product for home use is, however, distributed by concerns which buy nonfat dry milk in bulk from manufacturers, instantize it, and either package it or have it custom-packaged for retail sale. The very large distributors operating in this fashion instantize and package the product in their plants and distribute it through wholesalers or direct to chainstores under their own nationally known brand names. According to one trade estimate, three large, long-established dairy corporations supplied to stores and other retail outlets about 80 percent of the nonfat dry milk sold for home use in 1958. Small distributors buy nonfat dry milk in bulk, instantize it, and have it custom-packaged under the brand names of the buyers. Distribution costs vary, therefore, according to the marketing methods employed.

Processors sold nonfat dry milk in bulk to distributors at an average price of 13.7 cents a pound, f.o.b. plant, in December 1958. Distributors in turn sold the instantized, packaged product to wholesalers or others at an average delivered price of 36.1 cents a pound. Retailers bought the product from wholesalers at an average delivered price of 38.5 cents, and sold it to consumers at an average price of 47.2 cents a pound.

As shown by retail price data collected for the Agricultural Marketing Service by the Bureau of Labor Statistics, the average retail price of a pound of instant nonfat dry milk in 20 cities was 47.6 cents in January 1960, 3.4 cents higher than the average in February 1957. Between February 1957 and January 1960, the farm value of the skim milk equivalent of a pound of nonfat dry milk at retail dropped 1.1 cents. Thus, over a 36-month period the marketing margin rose 4.5 cents while the farmer's share of the retail price dropped from 19 to 16 percent.

NONFAT DRY MILK PACKAGED FOR HOUSEHOLD USE

Marketing Practices and Costs of Manufacture and Distribution

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INTRODUCTION

Sale of nonfat dry milk in retail packages is a relatively recent innovation in dairy marketing. Although nonfat dry milk was available to civilian consumers in the early years of World War II, and was widely used by the armed forces and by civilian populations abroad, it was not until well after the war's end that quality and ease of reconstitution were such that the product was generally acceptable to the American housewife.

Since 1948 sales of nonfat dry milk for home use have spiraled upward. From a little over 2 million pounds in 1948, sales rose to 30 million pounds in 1950, and to an estimated 169 million pounds in 1958. Meanwhile, total domestic nongovernment sales of nonfat dry milk for all food uses increased less than twofold--from 477 million pounds in 1948 to an estimated 851 million pounds in 1958 (1). 1/

Despite rapid growth, sales of nonfat dry milk for home use accounted for only about one-fifth of total domestic nongovernment sales of nonfat dry milk for food use in 1958. 2/ Sales for home use in 1958 were at the rate of less than 1 pound per capita out of a total use per capita of over 5 pounds, low in comparison with that for some other dairy products--12.6 pounds of evaporated milk per capita, 8.5 pounds of butter, and 17.6 pounds of ice cream, for example.

Nevertheless, the growing importance of sales has made it appear that the Department should publish information about the services performed and the costs involved in marketing nonfat dry milk for home use.

The purpose of this report, therefore, is to provide information concerning nonfat dry milk produced for home use: The cost of manufacture, the agencies involved in marketing the product, the functions they perform and the marketing practices they follow, the cost of their services, and the farm-to-retail price spread or marketing margin.

1/ Figures in parentheses refer to items in Literature Cited.

2/ Including that used by manufacturers of bakery, dairy, meat, confectionery, soup, soft drink, prepared dry mix, and other miscellaneous food products, and by chemical, pharmaceutical, and animal feed manufacturers, and that packaged for home use.

SOURCES OF INFORMATION

Information for this report was obtained from published sources, from personal interviews with manufacturers and others, and from questionnaires.

Although much material has been published in recent years about nonfat dry milk, none has included information on the cost of distribution or on marketing practices. Further, because instant nonfat dry milk for household use is a relatively recent innovation, only descriptive articles have appeared so far. None reviews the costs involved in manufacturing the new product and getting it from producer to consumer. In order to obtain such information, therefore, it was necessary to consult primary sources.

Processors of about 38 percent of the nonfat dry milk sold at retail in 1957 were visited in the summer of 1958. Information on the cost of processing and packaging the dry product, manufacturers' selling prices, manufacturers' marketing practices, and other general information about the industry was obtained at that time. No study of manufacturers' records was undertaken, however.

Wholesale buying and selling prices for popular sizes of packages of instant nonfat dry milk, and marketing practices of wholesalers who sold the product to retailers were obtained for December 1958 by means of a mail questionnaire. The questionnaire was sent to 60 food wholesalers in January 1959--3 in each of 20 cities for which retail price data were available. Fifty wholesalers responded.

Retail prices of instant nonfat dry milk in 20 cities ^{3/} have been collected monthly for the Agricultural Marketing Service (AMS) by the Bureau of Labor Statistics (BLS) beginning in February 1957. Prices obtained from the BLS are averages of the retail prices collected each month by local agents in each of the 20 cities. Agents secure the prices during the first 3 days of the week which includes the 15th of the month. The 20 cities were selected to cover all major geographic regions of the Nation. Agents were instructed to secure, in a sample of retail stores in each of the 20 cities, the price per pound for instant nonfat dry milk in the package size sold most frequently by each store.

Some information on the cost of packaging nonfat dry milk and on marketing practices was obtained from representatives of two large regional grocery chains and from two jobbers who purchased dry milk in bulk from manufacturers and instantized, packaged, and distributed it within limited areas.

Manufacturers of packaging materials supplied some information on the cost of various materials used by the dry milk industry for packaging instant nonfat dry milk for retail sale.

Dairy marketing specialists and others familiar with the nonfat dry milk industry and with food marketing in general were consulted. Statistical data on nonfat dry milk published by the Department and by others were used as needed.

^{3/} Atlanta, Baltimore, Boston, Chicago, Cincinnati, Cleveland, Detroit, Houston, Kansas City, Mo., Los Angeles, Minneapolis-St. Paul, New York City, Philadelphia, Pittsburgh, Portland, Oreg., St. Louis, San Francisco, Scranton, Seattle, and Washington, D. C.

SOME FACTS ABOUT NONFAT DRY MILK, ITS MANUFACTURE, DISTRIBUTION, AND USE

The Product

Nonfat dry milk is dried skim milk. It contains the lactose and the milk proteins and minerals in essentially the same relative proportions as the skim milk from which it is made.

For some years, nonfat dry milk was known to the trade as dry skim milk. In 1944, however, the Congress amended the Federal Food, Drug, and Cosmetic Act to establish a definition and standard of identity for the product. Under the terms of the amendment, the statutory name for the product was to be "nonfat dry milk solids" or "defatted milk solids" (30). In 1956, at the request of the dry milk industry, the dual name was deleted from the act, and the name "nonfat dry milk" substituted therefor (31). Many manufacturers, however, continue to include the designation "dry skim milk" on retail packages in addition to the designation "nonfat dry milk."

Instant nonfat dry milk is spray-dried skim milk which has been processed in such a manner that the powder particles are clustered or agglomerated. Because the particle clusters are large and porous, when they are added to water they dissolve quickly. Hence, the product is known as "instant" nonfat dry milk. It will retain its fluffy characteristics, and if kept dry will not cake in the package when allowed to stand for a period of time on a grocery store shelf or in the kitchen cupboard. Instant nonfat dry milk is used principally in the home for cooking and, when reliquefied, as a beverage. The dry equivalent of 1 quart of fluid skim milk is 3.2 ounces.

How Long on the Market

Drying milk to preserve it is not a recent concept. Marco Polo is said to have carried sun-dried milk on his travels through the Orient in the 13th century. Dried milk in tablet form was known in France in the 19th century. Several patents covering various processes for drying milk were issued in both the United States and Britain in the years between 1835 and 1886. Although the products made under these patents were not too satisfactory when judged by present standards, the work of the inventors was basic to those later researchers who persevered in their efforts to produce a satisfactory dry product.

By 1906, dry milk was being produced commercially in the United States, but the product varied greatly in quality and, for many years, production was limited to a relatively few concerns which supplied commercial and industrial users exclusively.

Over the years, better drying processes were developed and drying machinery and equipment were improved. By 1930, product quality standards had been established. Bakers and other commercial users were beginning to increase their purchases. Nevertheless, until the early 1940's, at least a third of the dry skim milk output was being sold for use as animal feed.

Because World War II created an urgent need for milk that could be shipped overseas, new drying plants were built and drying equipment was installed in

plants which previously had no drying facilities. Production of nonfat dry milk for human food rose spectacularly from 322 million pounds in 1940 to more than 640 million pounds in 1945 (table 1).

Table 1.--Domestic production of nonfat dry milk for human food, 1940-58 ^{1/}

Year	Production	Year	Production
	<u>1,000 pounds</u>		<u>1,000 pounds</u>
1940	321,843	1950	881,492
1941	366,455	1951	702,476
1942	565,414	1952	863,220
1943	509,620	1953	1,213,774
1944	582,912	1954	1,402,449
1945	642,546	1955	1,403,773
1946	653,465	1956	1,547,278
1947	677,941	1957	1,677,820
1948	681,532	1958	1,708,754
1949	934,934		

^{1/} Evaporated, Condensed, and Dry Milk Report (23).

Instead of falling off after the end of the war, production of nonfat dry milk continued to expand (table 1). Some was marketed at retail, but the bulk of all sales went into industrial and commercial channels.

The difficulty of reliequifying nonfat dry milk had long been recognized by the industry as a limiting factor in the sale of home packages. Development of a new processing method eventually solved this problem. A powdered skim milk easily soluble when added to water, was put on the market in the autumn of 1954 by a large dairy product manufacturer. Other processors were not long in entering the market with their versions of "instant" nonfat dry milk. Today, virtually all nonfat dry milk sold in retail stores is the quick-dissolving or instant type.

The Producers

In 1957, nonfat dry milk for human food was manufactured by more than 450 plants located in 36 States (29). By far the greater proportion of the total output, however, originated in areas of abundant milk supply--the dairy States of the Midwest, New York State, Pennsylvania, California, and Idaho. The area of instant nonfat dry milk production was considerably more restricted. The major proportion of the output came from plants in Wisconsin, Minnesota, and New York State.

Three large dairy concerns have tended to dominate the market for nonfat dry milk sold in retail packages for some years. Their share of sales is not known precisely. According to one of them, however, these three concerns together supplied to stores and other retail outlets almost 80 percent of the nonfat dry milk sold for household use in 1957 (3).

Nonfat dry milk for home use is marketed under many brand names. Nationally known brands, however, are few in number. These are essentially the brands under which the three largest concerns market their product. Brands of some national corporate chains might also be included. Regional brands, on the other hand, are more numerous, and new ones appear on the market from time to time. These brands are largely those used by regional chains, and by small independent and cooperative processors who distribute under their own labels.

The number of manufacturers' brands of nonfat dry milk in 1958 probably was not as great as it was 5 years earlier. Several processors who marketed under their own labels for some years, had made other arrangements to dispose of their product by 1958.

Two dairy cooperatives in the Middle West, for example, no longer sold their own brands of nonfat dry milk in 1958. Instead, they produced and packaged for large corporate grocery chains, one of which sold over a wide area, the other in the Eastern States. Packages carried only the chainstore labels. Another Midwest cooperative dairy concern, which began producing nonfat dry milk for retail sale under its own label a few years earlier, by 1958 was marketing only a fraction of its output in this fashion. The balance was packaged and sold to a Midwest corporate grocery chain which sold under the chain label both in its own and affiliated voluntary chainstores.

Still another Midwest cooperative, after years of operation, discontinued sales under its own label. In 1958 it was disposing of some product to one of the "big 3", which sells under its nationally known label, and was marketing the greater proportion through jobbers who packaged and distributed it in the South under several brand names.

Another cooperative, also located in the Midwest, marketed under its own label for several years. This producer also turned to packaging for and selling to a large eastern wholesaler under the wholesaler's label. The wholesaler in turn sold some of the product to retailers in eastern States and exported the remainder.

A further recent marketing development is of interest so far as small producers' brands are concerned. It was reported that several cooperative dairy concerns in the Middle West wanted to manufacture and sell instant nonfat dry milk. Because their individual outputs would be small, they arranged to have a single cooperative produce instant nonfat dry milk for them (17). This cooperative takes skim milk for drying from the various local cooperative dairy plants which are parties to the arrangement, most of which are primarily butter plants. The processing cooperative sells some instant nonfat dry milk under the co-op label, but sells by far the greater proportion of its output to a large corporate grocery chain operating in the North Central States. The product is marketed under the chainstore label.

A representative of one midwestern nonfat dry milk concern, consulted in the summer of 1958, mentioned that the difficulty and expense of "cracking" and holding a satisfactory retail market with a manufacturer's brand was becoming increasingly hazardous for some of the small processors of nonfat dry milk. He was of the opinion that these small processors may well arrange eventually to sell all their output to large distributors who in turn will package and sell under their own or merchandisers' labels.

The Manufacturing Process

Nonfat dry milk for household consumption is made by spraying skim milk under pressure into a drying chamber where it comes in contact with a current of warm filtered air. Moisture is thus rapidly evaporated from the milk, leaving a residue of solids in the form of minute particles. As they dry, the particles fall to the bottom of the drying chamber from which they may be removed for packaging.

Members of the American Dry Milk Institute, Inc., have agreed on standards of solubility and dispersibility which should be met by nonfat dry milk of instant grade (2). These standards may be achieved by more than one manufacturing process. There are several patented processes in the field, some of which were in litigation in 1959.

Essentially, two basic methods are used to make instant nonfat dry milk (6). Under one method, previously dried skim milk particles are clustered or agglomerated and then redried (18). To effect agglomeration, the powder is wetted to a slurry and then redried under carefully controlled conditions to permit lactose crystallization. Under the other method, skim milk is spray-dried in such a manner that large particles are formed shortly after spraying within the normal drying operation. Skim milk is concentrated and then atomized or sprayed into a very high velocity stream of moist air where high turbulence is said to cause the surface of the powder to become sufficiently tacky so that the particles stick together to form aggregates (34).

Although the instantizing process is relatively simple, considerable care must be taken at each step of the operation to prevent loss of powder solubility and flavor.

Cost of equipment needed for producing instant nonfat dry milk is not so high as to preclude small firms from entering the field. It may be high enough, however, to deter the very small plants--those with a milk supply of less than 8 million pounds a year--from undertaking to manufacture the product. 4/ Commercially available equipment, including dryers and instantizers such as small plants could accommodate, was estimated by processors to cost about \$30,000 in 1958. If building space to house equipment is added, the investment could run as high as \$50,000.

4/ It has been estimated that to afford drying equipment, a dairy plant should have a skim milk supply of at least 8 million pounds a year (13).

Quality Requirements

Nonfat dry milk sold to the Government for use as human food is required to meet certain quality standards established by the U. S. Department of Agriculture (USDA) (28).

Manufacturers consulted in the summer of 1958 were asked about the quality of the raw material they used to make instant nonfat dry milk, and the quality of their finished product. Those producing instant nonfat dry milk as part of a continuous drying-instantizing process stated that they used only high quality milk, much of it coming from producers of Grade A milk supplies. Their finished product was reported to be extra-grade spray-dried instant nonfat dry milk meeting all Federal and State standards. Those using nonfat dry milk as the raw material for the instant product reported that they used only extra-grade spray-dried nonfat dry milk meeting all Federal and State standards. All manufacturers reported that any nonfat dry milk meeting Government standards could be instantized, and that these standards preclude the use of anything but high quality milk.

Some instant nonfat dry milk is marketed under the labels of the buyers. Processors must frequently meet certain special quality requirements established by the buyers. One such processor reported that in addition to USDA standards, nonfat dry milk sold by his firm was required to meet more than 20 separate specifications established by the several buyers who marketed the milk under their own labels.

The dry milk industry has itself developed certain grade requirements for instant nonfat dry milk, which have been approved by the Board of Directors of the American Dry Milk Institute, Inc. (2). Many producers of nonfat dry milk for home use are members of the Institute. Standards approved by the organization are, of course, voluntary.

Packaging

Packages of nonfat dry milk displayed in grocery stores today are considerably different from those the housewife purchased as recently as 1952. Evolution in packaging has been rapid, particularly since instant nonfat dry milk came on the market.

Manufacturers of nonfat dry milk for household use faced difficult packaging problems from the start. Some of their problems have doubtless been shared by packagers of other products. Others are unique to the dry milk industry. Manufacturers have had to design a package which would be attractive but which at the same time would protect the contents from atmospheric conditions, fit readily on grocers' shelves, be light enough to be transported at reasonable cost but strong enough to withstand shipping, and be cheap enough to permit the product to compete with other dairy products.

Retail packages of nonfat dry milk are likely to pass through several hands before they reach the home. Consequently, because the product may be subject to uncontrolled storage conditions for weeks and even months, materials used to package it are of great importance.

Packaging to prevent moisture pickup has been troublesome. Federal standards specify that a moisture content of 5 percent is the most that can be allowed for nonfat dry milk sold to the Government for use as human food. Since moisture content is usually 3 percent when the product is packaged, 2 percent of moisture pickup is the most that can be permitted. As the moisture content increases, the dry milk tends to cake or "go stale," as the industry describes it. Stale powder is difficult to measure and to reconstitute, and has an objectionable flavor.

Some packaging materials will prevent moisture pickup, but they become brittle at high or low temperatures. Because nonfat dry milk has a great affinity for water, the product itself tends to embrittle many packaging materials by drawing water from them. Odors or flavors can be transmitted to the milk from some of the films otherwise suitable for package liners. Outside odors may be transferred through some outer packaging materials.

Sifting of nonfat dry milk has been a problem. Materials used for packaging must, therefore, be strong enough to resist breakage in the course of shipping and handling. Reclosure problems have also complicated packaging. To protect against moisture pickup after the package has been opened, some type of closure is requisite. It must be simple to operate and inexpensive.

Materials

Packaging developments have followed a pattern typical of that for many new products. As consumer preferences have been determined, industry has attempted to meet them. As deficiencies in packaging materials or design have become apparent, industry has sought to overcome them. This explains in some measure the wide variety of packaging materials and package designs used for nonfat dry milk over the years. Glass containers, coffee bags, fiber canisters, metal cans, flexible containers, and paper boxes have all been tried. Most have now disappeared.

Glass containers were moisture proof and could be closed tightly. Householders apparently liked them (9). Certain disadvantages developed, however, which eventually took them off the market. Loss from breakage was heavy, and, because of their weight, the cost of transporting them any distance was prohibitive. Probably their greatest disadvantage appeared when instant nonfat dry milk was introduced. Because instant nonfat dry milk is less dense than the noninstant product, a larger container is required for a given amount of product. Since shelf space in stores was limited, manufacturers who packed in glass eventually found it difficult to market their product.

Fiber canisters with friction tops had good reclosure features; the wide mouth made pouring easy; they weighed less than glass containers; and loss from breakage was small. But they were expensive.

Tin cans of various types were also tried. Some were hermetically sealed, similar to coffee cans with key openers. Others, similar to frozen fruit juice cans, were opened with a can opener. Since they could not be closed tightly after use, they were removed from the market.

Paper bags did not hold up well during shipment. Flexible containers too were tried, but because they could not be resealed, were not popular with buyers. When packaged in conventional paper boxes, the dry milk had a tendency to cake.

Virtually all nonfat dry milk sold at retail at the time of this study was packaged in specially treated oblong or square chipboard boxes. Package materials and construction range widely by brand, however, from film bags in modest polyethylene-coated, cereal-type boxes to boxes coated with polyethylene and wax and elaborately overwrapped in laminated polyethylene and foil. Some are double-overwrapped and are printed in several eye-catching colors. Many are complete with metal pouring spout. Some of the larger boxes are bridged--that is, a flexible paper strip is fastened inside each side of the box at the center to prevent the package from bulging during shipment. All packages carry instructions for reconstituting the product. Many carry recipes.

Sizes

Consumer buying habits have influenced package size. In the early years of retailing nonfat dry milk, processors felt that householders wanting to test the product would be likely to purchase small packages. Furthermore, the industry thought of the dry product in terms of its fluid milk equivalent and householders' typical fluid milk buying habits. Thus, relatively small packages containing a sufficient amount of powder to make 1, 2, or 3 quarts of fluid skim milk were standard for several years. Some packages contained nonfat dry milk in loose form; others contained several envelopes, each of which held the dry equivalent of 1 quart of fluid skim milk. ^{5/}

As consumers became aware of the product and began buying in quantity, larger packages appeared on the market. As has been mentioned, all packages were necessarily somewhat larger after instant nonfat dry milk was introduced in 1954.

About this time, moreover, market research had convinced certain processors that there was a market for larger packages, and even for some additional small packages. Packages containing the equivalent of 4, 6, and 8 quarts of fluid skim milk were soon marketed successfully. Packages containing sufficient product to make 12 and 20 quarts of fluid skim milk have come on the market even more recently. In certain areas of the country, other sizes--10-quart and 14-quart--are available. At the time of this study, however, the 3-, 4-, 5-, 8-, and 12-quart equivalent packages seemed to have the widest distribution. Because packages hold what might appear to be odd amounts--9.6 ounces, 12.8 ounces, etc.--the fluid milk equivalent is plainly printed on the outside of the box for the benefit of the buyer.

According to statements of several manufacturers, small packages sell particularly well in urban areas. Families there tend to be small; householders make frequent small purchases in nearby markets; and many take meals away from home regularly. The individual envelope-type package is also popular with

^{5/} For many years 3.5 ounces of nonfat dry milk were considered the dry equivalent of 1 quart of fluid skim milk. The ratio was changed in the early 1950's, and 3.2 ounces is now standard among processors.

urban consumers. Larger sizes are sold in areas, principally suburban, where families are larger and shoppers generally make large purchases at infrequent intervals.

Although nonfat dry milk packaged in loose form has tended to outsell that packaged in individual envelopes, the latter type of package has always been preferred by some buyers. One of the three largest distributors not previously packaging in individual envelopes added them to his package line in the spring of 1959.

In recent years it has frequently happened that a new size of package introduced by one manufacturer has soon been matched or outdone by a competitor. The costs of broad market research and promotion preliminary to introducing a new package are so high that only large concerns can underwrite them (3). Whether the "battle of size" will continue or will eventually be resolved by standardization of package size cannot, of course, be foretold. The high cost of market research and consumer testing and the scarcity of retail store shelf space could well be deterrents to any further proliferation of package sizes.

Custom Packaging

Not all manufacturers of nonfat dry milk package their own product. Some ship dry milk in bulk to jobbers who either package it themselves or have it custom packaged, and who then sell it to retailers.

Plant output of some of the small processors is not large enough to justify the expenditure required to install a packaging line. Others whose output might justify such expenditure have not chosen to undertake packaging, particularly since package sizes and types have changed so rapidly in recent years. Some, perhaps, have not yet determined whether or not they will continue to sell their products in retail package form, and therefore are not ready to take on the packaging function.

Distribution

Information supplied by processors who knew all the channels through which their product moved on its way to consumers indicates that household packages of nonfat dry milk are not marketed according to a single fixed pattern. Large concerns whose product is distributed nationally, in general tend to market their product in one fashion, while the small concerns, which sell mainly within limited areas, follow other practices. Small independents usually handle their own distribution. Some cooperatives sell through cooperative sales agencies, others market their own product.

A large proportion of the nonfat dry milk distributed by the three large dairy concerns is shipped from their plants to public warehouses usually located in large cities. Wholesale buyers in or near these cities are serviced from the public warehouse stocks. The wholesale buyers in turn generally sell and deliver the dry milk to retailers who are within reasonable trucking distance.

Smaller proportions of the output of the large concerns move in carlots direct from processing plants to customers, principally grocery chains, which warehouse the product until it is delivered to individual stores operated by the chain. Because chain organizations frequently handle several brands of nonfat dry milk, few are able to take carload lots of any one brand of powder regularly.

Nonfat dry milk produced by small concerns does not, as a rule, have national distribution. Most of it is distributed within limited areas.

It was mentioned earlier that some of the small processors have their nonfat dry milk output custom-packaged by jobbers who also take over the selling and distribution functions. Jobbers distributing in a limited area, particularly those packaging under buyers' labels, generally sell the packaged dry milk direct to retailers. Jobbers distributing over a wider area often sell through a second distributor who, in turn, sells to retailers.

At least one cooperative, which handles sales for local cooperatives, sells nonfat dry milk in bulk to wholesale distributors. These wholesalers in turn split the shipments up in accordance with customers' orders. The milk is then sent to jobbers who have it packaged under the various labels of their retail customers.

The percentage of nonfat dry milk sold by processors to others for re-packaging has varied over the years, but has generally been small, as shown in table 2. It has, however, been on the rise since 1952, and accounted for 17.6 percent of the total sold for home use in 1958.

Table 2.--Manufacturers' sales of nonfat dry milk to resellers for packaging as a percentage of all sales for home use, 1948-58

Year	Total packaged for home use	Sales to resellers for packaging	Sales to resellers as percentage of all home-use sales
	<u>Million pounds</u>	<u>Million pounds</u>	<u>Percent</u>
1948	2.4	0.6	25.0
1949	5.9	.4	6.8
1950	30.0	1.8	6.0
1951	58.8	.6	1.0
1952	84.9	6.5	7.7
1953	96.3	9.5	9.9
1954	141.6	15.5	10.9
1955	136.8	14.8	10.9
1956	154.2	24.5	15.9
1957	155.0	24.7	15.9
1958	169.4	29.9	17.6

American Dry Milk Institute, Inc. (1).

Sales through brokers are common among small processors. Although their product may have wide distribution, few of the small concerns are adequately staffed to promote and sell their own products. They have found it expedient, therefore, to package nonfat dry milk under their own labels, and to sell it through food brokers. The dry product is shipped to public warehouses in brokers' cities. When the brokers find buyers, the product is delivered from the warehouses direct to the retailers. Brokers do not take title to the merchandise, and as a rule do not sell to wholesalers. They do, however, take over some of the promotion and selling functions which small concerns are often unable to handle.

Some nonfat dry milk, produced largely by cooperatives, is sold to the three largest concerns which instantize it and package it under their own nationally known brands. After it is packaged, it is shipped, as explained above, to public storage warehouses in scattered locations, moved out as needed by wholesalers, and sold by wholesalers to retailers.

Direct shipments by small concerns are, of course, not unusual, although the number of such shipments may be small. As has been mentioned, several of the small concerns are now producing exclusively for and packaging under the labels of grocery chains, usually regional chains. Carlot shipments of nonfat dry milk made to these buyers move direct from processors' plants to chain warehouses, and from there to retail stores.

The examples given may not cover all the ways in which nonfat dry milk is marketed. It is likely that some of the product moves through additional channels, at least occasionally, on the way to the consumer. The examples given, however, appear to cover the practices followed by a majority of the concerns selling nonfat dry milk for home use in 1958.

Consumption

Nonfat dry milk was first sold at retail on a limited scale in the South beginning in the early 1930's (5). It was marketed by distributors who bought it in bulk from processors, repackaged it, and sold it under their own or buyers' labels. In 1942, nonfat dry milk carrying the brand of a large distributor appeared in retail markets in many parts of the Nation. However, despite wide advertising undertaken by this firm to counteract consumer aversions to dehydrated foods, consumers were slow to buy the product. Their reluctance to buy apparently discouraged other manufacturers from entering the field immediately.

Volume Sold

In 1948, the first year for which complete sales data are available, 2.4 million pounds of nonfat dry milk were sold at retail (table 3). Sales more than doubled in 1949, and multiplied almost fivefold in 1950. Sharp increases were recorded every year through 1954, the year instant nonfat dry milk was first marketed. During 1958, almost 170 million pounds were sold in packaged form to householders.

Table 3.--Sales of nonfat dry milk for home use as a percentage of total domestic nongovernment sales for food use, 1948-58

Year	Sales in packages for home use				
	Total domestic: nongovernment sales	Volume	Percentage of total domestic: nongovernment sales	Change over previous year	
				Volume	Percentage
	Mil. lb.	Mil. lb.	Pct.	Mil. lb.	Pct.
1948	477.0	2.4	0.5	---	---
1949	465.3	5.9	1.3	+ 3.5	+145.8
1950	550.5	30.0	5.5	+24.1	+408.5
1951	593.6	58.8	9.9	+28.8	+ 96.0
1952	690.1	84.9	12.3	+26.1	+ 44.3
1953	626.3	96.3	15.4	+11.4	+ 13.5
1954	719.2	141.6	19.7	+45.3	+ 47.0
1955	793.0	136.8	17.2	- 4.8	- 3.4
1956	807.4	154.2	19.1	+17.2	+ 12.7
1957	845.3	155.0	18.3	+ .8	+ .5
1958	851.5	169.4	19.9	+14.4	+ 9.3

American Dry Milk Institute, Inc. (1).

The drop in sales in 1955 and the leveling off of sales between 1956 and 1957 caused mild concern among some processors. Introduction of instant nonfat dry milk in 1954 had not resulted in any startling increase in sales. In fact, sales dropped 3.4 percent between 1954 and 1955 (table 3). Some producers were of the opinion that while they had probably retained their regular customers, many of whom may even have increased their purchases, the convenience of the instant product did not attract many new buyers.

When sales failed to increase perceptibly between 1956 and 1957, some processors feared that the market might have reached a plateau and that to move from the plateau extensive product promotion and broader consumer education would be required. But sales moved upward again in 1958 and were 9.3 percent above those of the preceding year, and 70 times greater than a decade earlier. Despite the year-to-year increase in sales, the fact that the rate of increase has slowed considerably since 1951 has been a cause of concern to the industry.

Household Use

The South generally has been the largest market for nonfat dry milk for home use, according to a survey of a nationwide sample of purchasers (27). This is the area in which the product was introduced in the early 1930's. The amount of nonfat dry milk purchased by families in the South exceeded that purchased by families in other regions in both 1955 and 1957 (26). The lowest volume of purchases was made by families in the Northeast during the periods covered by the survey.

The survey also disclosed that the amount of nonfat dry milk purchased by each buying family rose from 5.7 pounds in the 6-month period ended September 1954 to 5.9 pounds in the 6-month period ended September 1955, and to 6.3 pounds in the 6-month period ended September 1957.

During the 6-month period ended September 1954, 24.1 percent of all families purchased some nonfat dry milk. The proportion rose to 28.3 during the 6-month period ended September 1955, but dropped to 26.5 during a similar period in 1957.

The greatest proportion of all families buying nonfat dry milk at some time during the period studied was reported in the South in 1954 and 1957, and in the Pacific region in 1955. The smallest proportion was found in the North Central region.

Data showed further that in both 1954 and 1955 more families in the lower middle income group than in other groups purchased nonfat dry milk. In 1957, the greatest proportion of buying families was found among both the lower and middle income groups. Moreover, the greatest proportion of all buying families in 1954 was among those with six or more members. In both 1955 and 1957 on the other hand, the greatest proportion of buyers was shown to be 1- and 2-member families.

According to survey findings, buying families made an average of 4.1 purchases of nonfat dry milk in the period April-September 1954; 4.7 in April-September 1955; and 4.2 in April-September 1957. The number of purchases was greatest in the South in the 6-month periods ended September 1954, 1955, and 1957, lowest in the Northeast in 1954, and lowest in the Pacific region in both 1955 and 1957. In all regions except the Mountain Southwest, the number of purchases per buying family in 1957 was the same or higher than the number reported in 1954. In all regions, however, fewer purchases were made per family in 1957 than in 1955.

Other surveys (11, 15, 19, 35) made in restricted areas show that although many householders have purchased nonfat dry milk at one time or another, the number of users is still relatively small. These studies reveal also that the greatest use for nonfat dry milk in the home is for baking and cooking with its use as a beverage generally ranking second; and that many users, perhaps the greatest percentage of all users, buy nonfat dry milk sporadically. A smaller group of users who buy consistently are those on diets and those interested in family nutrition.

PROCESSING COSTS AND MARGINS

The greater proportion of the nonfat dry milk purchased by householders is processed by firms which sell it in bulk form to others for instantizing, re-packaging for retail sale, and distributing.

Processors' gross margins are measured by the difference between the farm price of the raw material and the cost of bulk nonfat dry milk to distributors. Over the 36-month period ended January 1960, processors' gross margins ranged between 6.3 and 7.1 cents a pound, and averaged 6.7 cents.

Processors' Costs

Processors' costs covered in this report include the cost to them of the skim milk used to make nonfat dry milk, and the cost of the manufacturing, packing, storing, and shipping services they perform.

Raw Material

A large proportion of the concerns manufacturing nonfat dry milk also manufacture butter. A few manufacture butter and evaporated milk in addition to nonfat dry milk. Most nonfat dry milk concerns buy only whole milk from farmers, although some buy small amounts of skim milk on occasion.

Because no series of skim milk prices is published, and because a value for the skim milk used could not be obtained direct from manufacturers of nonfat dry milk, other means of approximating a skim milk value were explored. One alternative was to use the price for milk sold to creameries.

The Agricultural Marketing Service publishes each month the average price that farmers receive for milk sold to creameries (25) and the monthly average price that farmers receive for the butterfat in farm-separated cream (22). Deducting the average price paid farmers for butterfat in farm-separated cream from the average price farmers received for whole milk sold to creameries, gave a "skim milk price" averaging about \$1 per hundredweight for the period covered by this report.

It is estimated that an average of 9.08 pounds of solids (14) may be obtained from 100 pounds of skim milk made from milk with a butterfat content of 3.85 percent, the average for milk bought by creameries in recent years (25). A skim milk cost of \$1 per hundredweight would mean, therefore, that the raw material in a pound of nonfat dry milk would cost manufacturers 11 cents. Nonfat dry milk was sold in bulk by manufacturers at an average price of 14.4 cents a pound over a 36-month period ended January 1960. Because manufacturers generally are not likely to pay 11 cents for the raw material in a product selling for 14.4 cents a pound, \$1 per hundredweight for skim milk would obviously not be a typical raw-material cost in nonfat dry milk production areas generally.

Processors consulted in this study operate butter-nonfat dry milk plants or butter-nonfat dry milk-evaporated milk plants. All receive the greater part of the raw material for nonfat dry milk in the form of whole milk. All consider their plants to be single entities regardless of the number of products manufactured. Consequently, since they reportedly have no accounting basis for allocating among products joint or common costs such as receiving and separating, processors were not willing to estimate the value of the skim milk separated from whole milk for use in the manufacture of nonfat dry milk.

Some processors of nonfat dry milk purchase skim milk on occasion from nearby creameries having a surplus. The amount purchased, however, is small, according to firms consulted, and does not exceed 5 percent of the total skim milk used annually in their nonfat dry milk operations.

As a second alternative to determining the value of the skim milk used to make nonfat dry milk, therefore, manufacturers were asked to estimate the average price they paid for skim milk purchased during the preceding 12 months. They pointed out that the price of skim milk varies seasonally, being lowest in the months of flush milk production. Moreover, according to these firms, such factors as the price of cream, the solids content of the skim milk, the Government support price for butter, and the competitive supply situation among cheese plants and nonfat dry milk plants have an important effect upon the price of skim milk.

Because there is a direct relationship between the butterfat content and the solids-not-fat content of milk (7, 8), some variation among plants in the amount of solids recovered from a unit of milk is to be expected. More efficient drying plants, moreover, can be expected to recover a higher percentage of solids from a given amount of milk than less efficient plants. The average butterfat content of milk used by nonfat dry milk processors giving cost data was reported to be 3.5 percent, and the average solids yield per hundredweight of skim milk, 8.6 pounds.

Some of the plants purchasing skim milk do their own hauling; some hire it done; and some have the milk tanked to their plants by the creameries from which it is purchased. Hauling costs vary, depending upon length of haul and other factors. Regardless of how the skim milk gets to a drying plant, however, a hauling cost is incurred. This cost is part of a plant's total cost for raw materials.

In August 1958 several midwestern manufacturers of nonfat dry milk were paying from 68 to 82 cents per hundredweight for skim milk bought from creameries. The cost of hauling the milk to their plants was reported to range between 5 and 12 cents per hundredweight.

Such variation in the costs of product and of transportation, and the fact that the costs reported were applicable to only a negligible amount of product, precluded the use of field-collected skim milk prices in this study.

The net farm value of the skim milk equivalent of a pound of nonfat dry milk is assumed in this report, therefore, to be the cost of the raw material. This net farm value figure is determined in the course of calculations which the Agricultural Marketing Service makes periodically in estimating the marketing charges for dairy products (21).

Over the 36-month period ended January 1960, the net farm value ^{6/} of the skim milk equivalent of a pound of nonfat dry milk ranged between 6.7 and 8.7 cents. It averaged 8.6 cents during the 12-month period ended January 1958. Effective April 1, 1958, however, the Government support price on milk for manufacturing was reduced. Buying prices for butter and nonfat dry milk were both reduced, but the proportionate reduction was greater on nonfat dry milk.

^{6/} If the plant picks up the milk at the farm, the hauling cost is deducted from the payment made to the farmer for his milk. If the farmer delivers his milk to the plant, he is not reimbursed for his hauling cost. What the farmer receives for his milk is, therefore, the net price after hauling costs have been deducted.

As a result of these changes, the net farm value of the skim milk equivalent of a pound of nonfat dry milk dropped sharply. For the 12-month period ended January 1959, it averaged 7.4 cents, 1.2 cents below the average for the preceding 12-month period, while for the 12-month period ended January 1960, it averaged 7.1 cents. The average for the entire 36-month period ended January 1960 was 7.7 cents.

Processing

Costs of processing nonfat dry milk in specialized and combination butter-nonfat dry milk plants in Middle Western and Western States have been analyzed in detail in several reports issued since 1950.

In 1953, the cost of manufacturing nonfat dry milk--excluding all assembly, receiving, separating, laboratory, packaging, and selling costs--in 18 Minnesota spray-drying plants ranged between 2.53 and 6.18 cents a pound, and averaged 3.23 cents (10). In an earlier study, manufacturing costs in 22 Minnesota spray-drying plants ranged between 2.50 and 4.76 cents a pound in 1947, and averaged 3.55 cents (4).

In other studies, manufacturing costs--again excluding assembly, receiving, separating, laboratory, packaging, and selling costs--for nonfat dry milk ranged as follows: Iowa (1955) 2.84 to 5.23 cents per pound (12); Iowa (1953) 2.89 to 5.42 cents per pound 7/; and Idaho-Oregon-Washington (1948-49) 2.03 to 7.52 cents per pound (32).

Since these cost studies were completed, there has been an appreciable rise in the general price level. Recent estimates of the monthly cost of processing milk into butter and nonfat dry milk in the New York milkshed show, for example, that costs there rose 41 percent between January 1948 and January 1958, while between January 1953 and January 1958 costs rose 15 percent. 8/

The greater proportion of all plants manufacturing nonfat dry milk in 1958 was in the Middle West. In this area, greater plant volume, increased production efficiency, and improvement in management and equipment since 1953 could be expected to have offset in large measure increases in other cost factors.

Packaging

Nonfat dry milk sold by manufacturers in bulk form for repackaging is generally packed in 240-pound fiber drums lined with polyethylene. The cost of drums of this size and type was reported by Juers and Koller (10) to be \$2.78 each in 1953, and by Juers 9/ to be \$2.87 in 1955-56.

7/ Kolmer, Lee. Spray Drying Costs in Low-Volume Milk Plants. Ph.D. thesis, Iowa State College, Ames, 1954. (Unpublished.)

8/ McAllister, C. Class III Milk in the New York Milkshed. IV. Processing Margins for Manufactured Dairy Products. U. S. Dept. Agr. Mktg. Res. Rpt. (In preparation.)

9/ Juers, Linley E. An Economic Analysis of the Operating Costs of Butter-Powder Plants with Particular Reference to the Problem of Joint Costs. Ph.D. thesis, Univ. of Minn., St. Paul, 1957. (Unpublished.)

The total cost of packaging nonfat dry milk in lined fiber drums was estimated to average 1.27 cents per pound in 18 Minnesota drying plants in 1953 (10). The cost in 15 Minnesota drying plants was estimated to be 1.19 cents a pound in 1955-56. 10/

Selling

Manufacturers who sell nonfat dry milk in bulk incur costs in selling their product.

Some concerns employ salesmen to sell their product. Many advertise regularly in dairy or other food trade journals.

It is necessary for some manufacturers to store nonfat dry milk either in their plants or in public warehouses until it is sold and delivered. Storage costs vary, depending upon the amount of product stored, the location of the storage facility, and the length of the storage period.

It is usual in the trade for manufacturers of nonfat dry milk to grant jobbers a discount for prompt settlement of accounts. Although the amount of the discount varies somewhat among producers, 2 percent 's reported to be a common allowance.

Manufacturers of nonfat dry milk load the product in rail cars for shipment to buyers. Any needed dunnage and bracing are provided at the shippers' expense.

Manufacturers who sell in bulk quote f.o.b. plant prices to buyers. Many also quote delivered prices--prices including delivery to buyers' cities. Most large manufacturers and some of the small concerns selling on a delivered basis issue schedules of zone prices (16). Under the zone pricing system, all buyers within the same zone pay identical delivered prices for the dry milk they buy from a particular supplier regardless of their location within the zone.

The number of zones delineated by manufacturers of nonfat dry milk ranges between three and five. One Midwestern manufacturer, for example, quotes prices for delivery anywhere in the United States according to location within any of five zones. Zone A, as delineated by this concern, is the "milk belt"; Zone B includes Eastern and Middle Atlantic States; Zone C includes all Southern States except Florida; Zone D covers only Florida; Zone E covers all States not included in the other zones. The delivered price in Zone A is in effect the base price. The price in Zone B is the Zone A price plus one-fourth cent per pound; the price in Zone C is the Zone A price plus one-half cent per pound, etc.

The average cost per pound for transporting nonfat dry milk in retail packages from Minneapolis, Minn., to 19 destinations is shown later in this report (table 5, page 28). Nonfat dry milk shipped in bulk is subject to the same rail freight rate per hundred pounds as that shipped in packaged form. The net amount of nonfat dry milk per carload when shipped in bulk is, however, greater than the net for nonfat dry milk shipped in retail packages. The average rail freight charge per pound of product is, therefore, somewhat less in bulk than in retail packages.

10/ See footnote 9.

Processors' Selling Prices

During the 12 months ended January 1958, processors' f.o.b. selling prices remained virtually unchanged at 15.5 cents a pound (table 4). Prices to distributors were reduced in April 1958 and continued at the lower level through January 1960, thereby bringing the average for the entire 36-month period to 14.4 cents.

Processors' Margins

Processors' gross margins for nonfat dry milk sold in bulk ranged between 6.3 and 7.1 cents a pound, and averaged 6.7 cents from February 1957 through January 1960 (table 4).

As shown in table 4, a slight downward trend in the average began early in 1958. As a result, gross margins averaged 6.6 cents a pound over the 12-month period ended January 1959, compared with 6.9 cents for the preceding 12-month period. A reversal of the downward trend, starting in April 1959, raised processors' average gross margins for the 36-month period ended January 1960 to 6.7 cents a pound.

DISTRIBUTING COSTS AND MARGINS

Some nonfat dry milk for home use is distributed by firms which perform the entire manufacturing-instantizing-packaging operation in their own plants. Small independent firms as a rule distribute instant nonfat dry milk, packaged under their own labels, through wholesalers or brokers. Cooperatives generally package under chainstore or other food distributors' labels and sell their product direct to these organizations.

The greater proportion of nonfat dry milk, however, is distributed by firms which buy it in bulk from manufacturers, instantize it, and either repackage it or have it repackaged for retail sale. The very large firms operating in this fashion instantize and package the product in their own plants, and distribute it under their own nationally known brand names. Smaller distributors, as a rule, instantize the nonfat dry milk which they purchase in bulk and have it custom-packaged under the brand names of the buyers.

Distributors' gross margins are the difference between the prices at which nonfat dry milk is purchased in bulk from processors and the cost to wholesalers or other buyers of the instantized, packaged product. Distributors' gross margins, therefore, include the costs of the services performed at the marketing level between the processor and the wholesaler of the packaged instant product.

Gross margins per pound of instant nonfat dry milk vary among distributors. Some of the variation results from differences in the channels through which the product is distributed, some from differences in brand and in size and type of package distributed. Much of the variation, however, apparently comes about because of differences in the pricing policies of individual distributors. In December 1958, distributors' gross margins for instant nonfat dry milk sold in five popular sizes of package in 18 cities averaged 22.4 cents a pound.

Table 4.--Average return to farmers, processors' average selling prices, and processors' average gross margins per pound of nonfat dry milk sold in bulk, February 1957 through January 1960

Year and month	Average return to farmers for skim milk equivalent of 1 pound nonfat dry milk	Processors' average f.o.b. selling price per pound of spray-process nonfat dry milk in bulk 1/	Processors' average gross margin, per pound
	Cents	Cents	Cents
<u>1957:</u>			
February	8.6	15.5	6.9
March	8.7	15.5	6.8
April	8.7	15.5	6.8
May	8.6	15.5	6.9
June	8.6	15.5	6.9
July	8.5	15.4	6.9
August	8.6	15.5	6.9
September	8.4	15.5	7.1
October	8.5	15.4	6.9
November	8.6	15.5	6.9
December	8.7	15.5	6.8
<u>1958:</u>			
January	8.7	15.5	6.8
12-month average ..	8.6	15.5	6.9
February	8.7	15.4	6.7
March	8.5	15.3	6.8
April	7.5	14.3	6.8
May	7.2	13.9	6.7
June	7.1	13.8	6.7
July	7.1	13.8	6.7
August	7.1	13.8	6.7
September	6.8	13.8	7.0
October	7.1	13.8	6.7
November	7.2	13.8	6.6
December	6.9	13.7	6.8
<u>1959:</u>			
January	7.2	13.7	6.5
12-month average ..	7.4	14.0	6.6
February	7.2	13.7	6.5
March	7.2	13.7	6.5
April	7.1	13.7	6.6
May	7.1	13.7	6.6
June	7.1	13.7	6.6
July	7.1	13.7	6.6
August	6.9	13.6	6.7
September	6.8	13.7	6.9
October	6.7	13.7	7.0
November	7.0	13.8	6.8
December	7.1	13.8	6.7
<u>1960:</u>			
January	7.5	13.8	6.3
12-month average ..	7.1	13.7	6.6
36-month average ..	7.7	14.4	6.7

1/ Evaporated, Condensed and Dry Milk Report (23).

Distributors' Costs

Distributors' costs considered in this report include the costs of instantizing and packaging nonfat dry milk, regardless of where these services are performed; promotion and advertising; distributing to wholesalers or other buyers; and various minor costs.

Instantizing

Information on the cost of instantizing nonfat dry milk was obtained in 1958 from several nonfat dry milk concerns, three-fourths of which were cooperatives, the remainder independently owned and operated. All manufactured and instantized the product at one or more plants on a year-round basis. All manufactured one or more other dairy products in addition to nonfat dry milk. No cost data were provided by any of the three very large independent concerns.

Firms providing data were using commercially available equipment which dries and instantizes in a continuous operation. While no more manpower is required to operate drying-instantizing machinery than drying machinery alone, the instantizing operation slows down production per hour per man. Thus, more man-hours and more machinery-hours are required to produce a given quantity of instant than noninstant nonfat dry milk.

According to the firms consulted, their accounting records were not such that they could separate the instantizing costs precisely. Thus, they were able to give estimates rather than exact costs for the instantizing operation. The estimated cost of instantizing nonfat dry milk ranged from 1.5 to 2.0 cents a pound in 1958. A jobber who was also consulted and who buys nonfat dry milk in bulk from manufacturers, estimated that in 1958 it cost him 3 cents a pound, on the average, to instantize the product.

Packaging

Information on packaging costs was obtained in 1958 from several small processors who package their own product. These concerns were asked to include in their estimates the cost of their entire packaging operation--the cost of all materials including shipping cases; all direct and indirect labor costs of filling and sealing dry milk packages and shipping cases; and all overhead costs associated with the packaging operation. Some information on costs of materials was also obtained from suppliers of packaging materials who tailor their products to fit the needs of individual packagers.

According to information supplied by concerns consulted in 1958, the total cost of packaging nonfat dry milk in the individual envelope-type retail package tends to be relatively high, particularly so far as the small packages are concerned. For example, the total cost--labor, capital, and materials--of packaging three-fifths of a pound of nonfat dry milk in three envelopes in an overwrapped chipboard box was reported to be approximately 8.2 cents, or about 13.5 cents per pound of product. The cost of packaging an overwrapped 2-pound package containing 10 individual envelopes was reported to be 15 cents per package, or 7.5 cents per pound of product. The cost of packaging three-fifths

of a pound of instant nonfat dry milk in loose form in an overwrapped box was estimated to be 5.1 cents, or 8.4 cents per pound of product.

Labor, materials, and overhead expense for packaging a pound of loose powder in a chipboard carton overwrapped in foil, reportedly cost one firm about 8 cents. Another reported that the cost of packaging in a simple package holding a pound of nonfat dry milk in loose form came to about 4 cents.

Packaging 1.6 pounds of loose product in a bridged box overwrapped in laminated polyethylene and foil reportedly averaged 8.4 cents, or about 5.3 cents per pound of product in 1958.

To package 2.4 pounds of loose nonfat dry milk in an overwrapped box with pouring spout cost approximately 11.3 cents, or 4.7 cents per pound. To package the same amount of product in a more modest package without overwrap or pouring spout was reported to cost about half as much as the cost of packaging in the more elaborate package.

The components of the total packaging cost--labor, capital, and materials--were estimated separately in only a few instances. Processors generally tended to combine labor and capital costs. As might be expected, the relationship between these cost components varied among firms.

According to estimates, material costs for the smaller packages of loose product were about equal to labor and capital costs combined. On the other hand, material costs represented the greater part of the total cost of packaging the larger packages. Labor and capital costs represented almost four-fifths of the total cost of packaging one brand of nonfat dry milk in a 3-envelope style of package, but about half of the total packaging cost reported by a concern which packed the same amount of product in loose form in a package with no overwrap.

For shipment to buyers, packages of instant nonfat dry milk are packed in corrugated paper shipping containers or cases. Normally the 3-, 4-, and 5-quart sizes are packed 24 packages to a case containing respectively 14.4, 19.2, and 24 pounds of product. The 8- and 12-quart sizes are packed 12 to a case containing 19.2 and 28.8 pounds of product.

Suitable packing cases cost between 4.0 and 6.5 cents each, depending upon size. The weighted average cost for all sizes needed to accommodate the amounts of nonfat dry milk shown above is estimated to be 5.7 cents each, or approximately 0.28 cent per pound of product.

An estimate of the labor and capital costs of filling and sealing shipping cases was obtained from only one distributor. He estimated that the cost of this operation would average "in the neighborhood" of one-half cent per pound of product.

Total packaging costs reported were weighted in accordance with wholesalers' estimates of the percentage of their December 1958 sales represented by 3-, 4-, 5-, 8-, and 12-quart packages of instant nonfat dry milk. Weighted on this basis, the cost of packaging nonfat dry milk averaged 7.5 cents per pound.

Selling

Selling costs account for an important share of the total costs incurred by most distributors of nonfat dry milk for home use. The items making up the total are directly related to the marketing practices followed. Selling costs, therefore, may include promotion and advertising costs; fees to brokers or others who handle sales; discounts to wholesalers or jobbers for prompt cash payment; long-haul transportation charges incurred in shipping to buyers; and storage charges incurred while the product is awaiting sale or delivery.

Promotion

In general, firms distributing nonfat dry milk for home use were reluctant to discuss their promotion costs. Many considered them burdensome; some thought that they did not incur them; all would like to avoid them. There is great activity, however, among small firms trying to establish themselves in the industry. Furthermore, because instant nonfat dry milk is such a new product, sales are still only moderately large. Most distributors, therefore, make regular expenditures for advertising or otherwise promoting the sale of their product. The amount spent varies according to the volume of product a firm may have for sale, and upon the marketing practices it follows.

How much the three largest distributors spend for promoting sales of their brands of nonfat dry milk is a well-kept secret. Because their products have national distribution, however, their promotional activities are necessarily broad, varied, and probably expensive.

Although the total spent by the large concerns to promote sales of nonfat dry milk exceeds that spent by small firms, on a per unit of product basis the amount spent may be less for several reasons. Sales volume of the large distributors is greater, permitting the spread of advertising costs over a broader base. They usually sell products in addition to nonfat dry milk and are thus able to use a single sales force and advertising medium for their entire product mix. Moreover, a new product, such as instant nonfat dry milk, marketed under a well-known trade name is likely to encounter less sales resistance, and thus require less promotion, than a new product marketed under a little-known name.

Considerable market research and consumer testing is usually undertaken by the large distributors before a new product is introduced, or before a change is made in an older product. Although the immediate cost of such surveys is high (3)--probably well beyond the ability of small concerns to undertake--they do provide information about what consumers want, where and when to increase promotion, and the groups of buyers they could reach most effectively with an advertising program.

Promotion media employed by the large distributors of instant nonfat dry milk include national television and radio programs, spot television and radio commercials, and advertising in magazines with national circulation. Special concessions to wholesalers and price allowances to retailers are common. Large distributors also advertise in local newspapers, give free samples, and give demonstrations of their product in local stores, particularly in large supermarkets in neighborhoods where family shopping is customary.

Product advertising undertaken by small distributors is on a far more modest scale, however costly it may be for them individually. The experience of one such concern may be representative of that of others marketing under their own labels.

According to this concern, it is a truism that without sales volume a company cannot spend much on product promotion, yet unless it promotes its product it cannot increase sales volume, or sometimes maintain its present volume. As was pointed out, competition for shelf space in food stores is so keen that any brand of product which does not sell rapidly is soon replaced by another brand. 11/ Thus, according to this distributor, small processors selling their own brands of nonfat dry milk often find it difficult to keep their product on grocers' shelves.

It was also mentioned that because small distributors cannot afford to make extensive market surveys or use the expensive advertising media employed by the large distributors, their promotion activities take less expensive forms. Spot announcements on local radio stations, announcements over food store loud-speakers, coupon attachments to packages, 2-for-1 offers, and "welcome wagon" give-aways to new residents are common practices. This concern, like other small manufacturers, hires local "shoppers" to make periodic checks of retailers' stocks to see that its brand of nonfat dry milk is on store shelves and that its displays are being maintained. Small distributors also buy some advertising space in local newspapers, carry a small amount of advertising in dairy trade journals, and distribute some point-of-sale advertising material.

The manufacturer giving this information considered it advisable to spend, on the basis of present sales volume, no more than 5 cents per pound of nonfat dry milk for promotion and advertising. It is not known whether this figure represents a typical promotion cost for any important segment of the nonfat dry milk industry.

Those processors consulted who sell their entire output to single outlets were of the opinion that they incur no promotion or advertising expenses. One cooperative concern, for example, which handles nonfat dry milk sales for several small local cooperatives, sells the entire output to a large wholesaler who in turn sells the product under his own label. The cooperative reported that the wholesaler handled all promotion and advertising for his own brands. No information was given concerning the expenses incurred by the cooperative in the process of making the present selling arrangements, or the selling expenses incurred before the present arrangements were made.

Another cooperative firm reported that all product promotion was handled by buyers, in this instance jobber-packagers who buy from the cooperative in bulk and pack under their own or buyers' labels.

Still another small local cooperative estimated that in 1958 advertising expenses were averaging only about 1 cent per pound of nonfat dry milk because of the low volume sold under the cooperative label through a wholesale

11/ According to the American Supermarket Institute, food stores such as supermarkets regularly carry thousands of different grocery items, and are offered more than 100 new items each week (33).

distributor. About 60 percent of this plant's output, however, is sold direct to a regional corporate grocery chain which markets the dry milk under the buyer's label. The cost of promoting the present distribution arrangements was not revealed.

Fees and Discounts

Some manufacturers of nonfat dry milk for home use sell their product to retailers through food brokers. Concerns which sell in this manner are generally small manufacturers who package under their own labels and who do not maintain sales departments within their own organizations.

In addition to selling, some brokers provide manufacturers with market information they need to plan their operations. Some brokers, for example, keep detailed records of the sales of competing products by chainstores and other retail outlets. Some keep clients informed of market developments generally, and sometimes of activities of competing firms. Others concentrate entirely upon selling.

Brokerage fees, usually a fixed percentage of each dollar of sales handled, vary in accordance with the amount of service rendered to a client. The fee paid to a broker who takes over some promotion and market research functions for a processor tends, therefore, to reflect the value of the special services he performs. According to information obtained from a nonfat dry milk manufacturer who sells through brokers, a 5 percent brokerage fee is standard. Although this is higher than the fee paid to brokers of dry groceries generally, in this instance it may cover services which the processor would have to provide in some other fashion, perhaps at higher cost.

Trade discounts to buyers for prompt settlement of their accounts with manufacturers is a business practice of long standing. Discounts allowed wholesalers, jobbers, and other buyers by nonfat dry milk producers are reported to average 2 percent.

Long-Haul Transportation

The price at which distributors sell packaged instant nonfat dry milk to wholesalers, jobbers, or retailers is a delivered price, which means that the distributor pays the long-haul freight charges incurred in moving the product from his plant to the buyer's city.

Long-haul movement of nonfat dry milk from distributor to buyer is primarily a rail movement. Motortrucks are used, however, by some distributors who sell within limited areas and therefore ship their product relatively short distances. Motortrucks are also used on occasion by most distributors for emergency shipments to buyers whose stocks must be replenished quickly.

Nonfat dry milk packaged for home use is considered for shipping purposes to be canned goods, and therefore takes a canned-goods rate. This rate, incidentally, is the same as that for evaporated milk in cans. Because the product needs neither refrigeration nor heating service while in transit, no charge other than a straight hauling charge is incurred during shipment.

Distributors report that they use rail rather than truck facilities to ship packaged nonfat dry milk because rail freight charges per unit of product are lower than truck charges on hauls of more than a few hundred miles.

The rail freight rate on nonfat dry milk shipped in carlots--36,000 pounds minimum--between Minneapolis, Minn., and Atlanta, Ga., for example, is \$1.03 per hundredweight. The motortruck rate for shipping the product in truckloads--36,000 pounds minimum--between the same two points is \$2.49 per hundredweight. The rail carload rate between Minneapolis and Scranton, Pa., to cite another example, is 99 cents per hundredweight, while the motortruck rate is \$2.18 per hundredweight.

Because the rates per unit of product shipped to many destinations in less than carlots are considerably greater than the rates for full carlots, shippers naturally try to schedule their shipments so as to take advantage of the carload rates.

Large concerns which ship to public warehouses for further distribution to wholesalers and retailers can frequently ship full carloads at one time. Shipments direct from plants to chainstore warehouses are often made in carlots. Some shippers, particularly the smaller ones, frequently have orders for less than carlots of dry milk. These shippers can get carload rate advantages, however, if they are willing to use certain shipping services to which some additional charges are attached. ^{12/} They can, for example, ship in pool cars--cars in which the merchandise of several shippers is pooled to make up a full carload. They can also use stopover cars--cars which are stopped at various points while in transit for unloading a portion of the original carload of merchandise. Concerns distributing both nonfat dry milk and evaporated milk frequently ship both products to the same destination. Since the freight rate is the same for both products, a mixed carload can be shipped at the regular carload rate.

Large shippers consulted in connection with this report were of the opinion that they ship enough and often enough to be able to get the types of rail service they need to maintain buyers' stocks without difficulty. Some of the small concerns reported occasional delays in getting cars, some difficulty in getting reasonable destination points on pool car shipments, and on occasion, undue delays with stopover car service.

Distributors of nonfat dry milk sell their product to buyers at a uniform delivered price per case. While this delivered price may be high enough in many instances to cover freight charges between shipper and receiver, it is likely that some freight expense is absorbed by distributors, particularly those whose product is shipped over wide areas. The procedure used by distributors for "equalizing" their freight charges on instant nonfat dry milk was not ascertained. Hence, the amount of freight expense they absorb is not known.

Rail freight charges per pound of nonfat dry milk packed in five popular sizes of package and shipped in carloads between Minneapolis, Minn., a centrally located shipping point, and cities for which retail prices were available, are

^{12/} Charges of freight forwarders for assembling shipments and charges of transportation agencies for stopping cars in transit.

shown in table 5. The average rail shipping charge per pound of nonfat dry milk by size of package is also shown for each of four sales areas and for the four areas combined.

In December 1958, the weighted average rail freight charge per pound of nonfat dry milk packed in 5 popular sizes of package and shipped to 19 destinations would have been 1.1 cents when weighted by wholesalers' estimates of their distribution of nonfat dry milk by size of package.

Local Cartage

A few shippers pay all the transportation costs on instant nonfat dry milk from plant to buyers' stores or warehouses. Concerns selling the product through brokers, for example, maintain warehouse stocks in the brokers' cities. As it is needed, the milk is trucked from the warehouse to buyers at the seller's expense. Local cartage costs were estimated by distributors to average three-fourths of a cent per pound.

Other Selling Costs

Large distributors ship their product to numerous public warehouses about the country, where it is stored at the shippers' expense while awaiting sale to wholesalers or other buyers. These distributors estimate that the dry milk stays in storage an average of 60 days. Distributors who sell through brokers and store in public warehouses in brokers' cities estimate that the storage time is about 30 days. Warehousing costs as reported by distributors ranged from one-half to three-fourths of a cent per pound of nonfat dry milk, depending upon the length of the storage period, the amount of product stored, and the location of the storage facility.

Other Costs

In addition to the major cost items listed above, certain other costs are likely to be incurred by distributors of nonfat dry milk. In general, they are minor, at least when considered individually; they do not recur regularly; nor are all common to all firms.

Some product is lost in removing it from dryers. Some may be lost in packaging. Some may be lost during loading and unloading operations.

Packaging materials are frequently damaged during storage and on packaging lines.

Some firms truck dry milk regularly from one of their plants to another for packaging. Packaging materials are sometimes picked up at railroad freight stations and trucked to plants for storage and later use. Firms doing the packaging pay the hauling costs in both instances.

To prevent damage to cargo from jarring and shifting while in transit, shippers must sometimes install bracing and dunnage in rail cars and motortrucks. Materials and labor are supplied by the shipper.

Table 5.--Railroad freight charge per pound of instant nonfat dry milk shipped in carloads from Minneapolis, Minn., to 19 destinations, 1958 ^{1/}

Destination	Size of package				
	3-quart	4-quart	5-quart	8-quart	12-quart
	Cents	Cents	Cents	Cents	Cents
<u>Northeastern sales area:</u>					
Boston	1.3	1.2	1.2	1.2	1.2
New York City	1.2	1.2	1.1	1.2	1.1
Philadelphia	1.2	1.2	1.1	1.2	1.3
Pittsburgh	1.0	1.0	.9	1.0	.9
Scranton	1.1	1.1	1.0	1.1	1.0
Area average	1.2	1.1	1.1	1.1	1.1
<u>North Central sales area:</u>					
Chicago	0.6	0.5	0.5	0.5	0.5
Cincinnati	.9	.8	.8	.8	.8
Cleveland	.9	.9	.8	.9	.8
Detroit	.8	.7	.7	.7	.7
Kansas City, Mo.	.7	.6	.6	.6	.6
St. Louis	.7	.7	.7	.7	.7
Area average	0.8	0.7	0.7	0.7	0.7
<u>Southern sales area:</u>					
Atlanta	1.2	1.1	1.1	1.1	1.1
Baltimore	1.2	1.2	1.1	1.2	1.1
Houston	1.2	1.2	1.1	1.2	1.1
Washington, D. C.	1.2	1.2	1.1	1.2	1.1
Area average	1.2	1.2	1.1	1.2	1.1
<u>Western sales area:</u>					
Los Angeles	2.1	2.0	1.9	2.0	1.9
Portland, Oregon	2.0	1.9	1.8	1.9	1.8
San Francisco	2.1	2.0	1.9	2.0	1.9
Seattle	2.0	1.9	1.8	1.9	1.8
Area average	2.0	1.9	1.8	1.9	1.8
Weighted average, all destinations	1.2	1.2	1.1	1.2	1.1

^{1/} Assuming 60,000 pound minimum carload. Charges were computed by the Transportation and Storage Services Division, Commodity Stabilization Service, U. S. Department of Agriculture, on the basis of railroad rates developed from tariffs on file with the Interstate Commerce Commission.

Demurrage, the charge made for holding cars for loading or unloading beyond the free time allowed by the transportation agencies, must be paid by shippers.

And all distributors incur certain indirect labor costs--fringe benefits, for example--which may not have been distributed fully among the above-mentioned major cost components.

Although miscellaneous costs were mentioned by firms consulted in the course of this study, none was able to measure them precisely in terms of a unit of instant nonfat dry milk. Most noted only that individually these miscellaneous items would "add only a fraction of a cent per pound of powder" to their costs.

Distributors' Selling Prices

The price at which distributors sell instant nonfat dry milk to wholesalers, jobbers, and retailers varies by size of case and by brand, but is uniform for each brand so far as any given size of case is concerned.

Distributors' average selling prices per pound of nonfat dry milk packaged in five popular sizes of package were computed from the buying prices reported by wholesalers in 18 cities. These prices are grouped by sales areas in table 6. In December 1958, distributors sold instant nonfat dry milk at an average price of 36.1 cents per pound. ^{13/}

With the exception of the 8-quart package, distributors' selling prices in December 1958 tended to be lower for nonfat dry milk packed in the larger than in the smaller packages. In most cities, the price in 8-quart packages was about 0.7 cent per pound higher than the price for 5-quart packages. In two cities, however, the difference was wider--5.1 cents in one city and 6.7 cents in the other.

The range in distributors' selling prices by size of package and sales area in December 1958 is shown in table 7. For some sizes, the range was significant. There was a range in area prices, for example, of 5.8 cents a pound for nonfat dry milk packed in 5-quart packages, and a range of 3.7 cents a pound for that packed in 4-quart packages. On the other hand, the range in selling prices for nonfat dry milk packed in 3-, 8-, and 12-quart packages was only about 1.5 cents a pound.

Distributors' Margins

In December 1958, distributors' gross margins per pound of instant nonfat dry milk were as follows: 25.4 cents a pound for milk packed in 5-quart packages; 22.3 cents for that packed in 4-quart packages; 20.4 cents for that packed in 5-quart packages; 21.8 cents for that packed in 8-quart packages; and 17.8 cents for that packed in 12-quart packages. Distributors' weighted average gross margins ^{14/} for instant nonfat dry milk packed in all five packages was 22.4 cents per pound in December 1958.

^{13/} Price weighted in accordance with wholesalers' estimates of their December 1958 sales by size of package.

^{14/} See footnote 13.

Table 6.--Distributors' average selling prices of instant nonfat dry milk by sales areas and by size of package, December 1958 ^{1/}

Sales area	Average selling price per pound for--				
	3-quart package	4-quart package	5-quart package	8-quart package	12-quart package
	Cents	Cents	Cents	Cents	Cents
Northeastern	39.0	36.1	<u>2/</u>	35.4	31.5
North Central	39.2	36.5	33.9	35.5	31.5
Southern	39.2	<u>2/</u>	<u>2/</u>	35.8	31.7
Western	38.8	35.3	34.5	35.3	31.3
Average, all areas ^{3/}	39.1	36.0	34.1	35.5	31.5

^{1/} Average of buying prices reported by wholesalers in response to questionnaire. In some cities, f.o.b. and delivered prices were averaged.

^{2/} Data omitted in order that confidential information would not be revealed.

^{3/} Includes data omitted from averages for individual areas.

Table 7.--Range in distributors' selling prices of instant nonfat dry milk by sales areas and by size of package, December 1958 ^{1/}

Sales area	Range in selling price per pound for--				
	3-quart package	4-quart package	5-quart package	8-quart package	12-quart package
	Cents	Cents	Cents	Cents	Cents
Northeastern	38.8-39.6	36.0-36.3	<u>2/</u>	35.2-35.5	31.2-31.8
North Central	38.2-39.6	35.9-36.7	29.2-35.0	34.9-35.9	30.2-31.8
Southern	39.0-39.6	<u>2/</u>	<u>2/</u>	35.7-35.9	31.5-31.8
Western	37.8-39.6	33.0-36.7	33.8-34.7	34.6-35.9	30.8-31.8
All areas ...	37.8-39.6	33.0-36.7	29.2-35.0	34.6-35.9	30.2-31.8

^{1/} As shown in wholesalers' replies to questionnaire.

^{2/} Data omitted in order that confidential information would not be revealed.

WHOLESALE COSTS AND MARGINS

Gross wholesale margins for instant nonfat dry milk are the difference between distributors' prices to wholesalers and the cost of the product to retailers. Margins include the cost of all marketing services performed by the wholesaler--buying, storing, selling, and delivering.

Gross margins of wholesalers of instant nonfat dry milk vary widely by geographic regions. Some variation in the margin is due to differences in brand of product handled, some to difference in size and type of package handled. Much of the variation, however, is apparently the result of differences in the pricing policies of individual wholesalers.

In December 1958, wholesalers' gross margins for 5 popular sizes of package of instant nonfat dry milk ranged between 0.4 and 4.9 cents per pound in 18 cities, and averaged 2.4 cents.

Wholesalers' Costs

Information on wholesalers' marketing practices and distribution costs was obtained by means of a mail questionnaire. The information thus obtained is presented here as an example of the marketing practices followed and some of the costs incurred by wholesalers of nonfat dry milk.

To ease the reporting burden, wholesalers were asked only for information on their buying and selling prices in December 1958, on sales by size of package, and on their pickup and delivery practices. All wholesalers responding to the questionnaire purchased nonfat dry milk in retail packages from distributors. All sold the product direct to retailers.

Wholesalers who buy instant nonfat dry milk from distributors are regular food wholesalers who buy, store, sell, and deliver dry groceries to retailers. Their methods of marketing nonfat dry milk do not differ from their methods of marketing other dry grocery products. Business practices of food wholesalers vary widely, however. Some require that orders be of a certain minimum value if delivery is to be made. Some make frequent, often daily, deliveries. Others stagger their delivery days among city delivery areas, and make only infrequent deliveries in rural areas.

Food wholesalers generally sell to retailers, although sales to other wholesalers or jobbers are not uncommon. In recent years, wholesalers have tended to sell more merchandise to independent retail grocers than to chains. Information received from wholesalers in response to the questionnaire disclosed, for example, that 76 percent of all those responding sold no nonfat dry milk to grocery chains. Of the remaining 24 percent which sold both to chains--usually local chains--and independents, 72 percent reported that less than half of their nonfat dry milk sales were to chains. As has been mentioned, because their volume of purchases is relatively large, many corporate chains in recent years have been buying direct from processors.

Most food wholesalers deliver to buyers. Again, however, it is not unusual for some buyers, particularly those who buy in small quantity, to buy on a cash-and-carry basis.

Buying

In some instances wholesalers pick up their dry milk purchases at public warehouses or railroad freight stations and haul them to their own warehouses. Sometimes their trucks make special trips to pick up the dry milk, and at other times their delivery trucks pick it up when returning from regular delivery routes. In other instances, distributors deliver the dry milk by motortruck direct to wholesalers' docks.

Public warehouses usually are located in what is known as the wholesale or market district of many cities. Thus, the distance a wholesaler's truck must travel to pick up merchandise may not be great. Because wholesale and storage areas are often congested, however, the labor cost for drivers and helpers may be relatively high. No information was obtained from wholesalers on the approximate cost of picking up merchandise from local storage.

Storage

Because wholesalers do not usually purchase instant nonfat dry milk far in advance of their actual needs, the product seldom remains unsold in their warehouses for any long period of time. Information obtained from wholesalers shows a turnover of their stocks of instant milk 9 to 10 times a year, on the average. Under such circumstances, the product would ordinarily be warehoused 35 to 40 days. Storage costs were estimated by a few wholesalers to average about 3 percent of their selling price to retailers.

Selling

Wholesalers of nonfat dry milk, and perhaps other products, have tended in recent years to take over some of the promotion functions formerly handled by distributors. A wholesaler, for example, may offer an attractive price on a particular brand of a product for a limited time to acquaint both regular and new customers with the product. Again, he may actively promote a particular size of package. The distributor is thus relieved, to some degree at least, of the necessity for promoting sales of his product in certain areas.

Wholesalers, as mentioned, usually deliver merchandise to buyers. Some buyers are located in the wholesaler's city. Others are located in suburban or rural areas often at some distance from the wholesaler's warehouse. The cost of delivering merchandise to buyers must be reflected in the wholesale selling price.

It was possible in a few instances to determine directly from the questionnaire what wholesale delivery charges were. A few respondents reported their f.o.b. selling prices and noted that their delivered prices were their f.o.b. prices plus a delivery charge which varied according to delivery distance but did not exceed a stated percentage--2 to 2.5 percent, for example. Others noted that their delivery charges varied according to size of order and delivery distance. One firm, for example, reported delivery charges ranging from 1.5 percent on orders of \$200 and less to 1 percent on orders of \$10,000 or more delivered in the city, and charges ranging from 2 percent on orders of \$200 and

less to 1.5 percent on orders of \$10,000 and more delivered in the country. Depending upon the size of order, delivery charges of this firm ranged from 0.4 to 0.6 cent per pound of nonfat dry milk delivered in the city, and from 0.6 to 0.8 cent per pound delivered in the country.

While these data are precise, they were reported by only a small proportion of wholesale firms, and moreover, may reflect somewhat more than the actual cost of delivery. In order to determine approximate delivery costs or charges for a greater segment of firms, questionnaires were examined from another approach.

In the questionnaires, f.o.b. prices were sometimes reported by one firm and delivered prices by another operating in the same city. Thus, for purposes of analysis, it was assumed that any difference between reported f.o.b. and delivered prices might afford a rough measure of the cost of delivery. The difference between the reported f.o.b. and delivered prices in the four sales areas was as follows:

	<u>Cents per pound</u>
Northeast	1.2
North Central	1.4
South	1.5
West	.7
Average, all areas .	1.2

In view of the size of the wholesale margin, which will be discussed later in this report, a delivery cost of 1.2 cents per pound of instant nonfat dry milk is obviously excessive.

The cost of delivering dry groceries was estimated in a 1954 study of the efficiency of delivery operations of an independent wholesale grocery firm in Baltimore, Md. (20). According to the report, delivery costs of this single firm averaged 2.22 cents per dollar of sales for all sizes of dry grocery orders and all delivery distances. Costs of this firm ranged widely, however, depending upon the size of the order and the area of delivery. For example, on orders under \$25, costs ranged from 18.46 cents per dollar of sales for delivery in rural areas to 5.93 cents per dollar of sales for delivery in urban areas. For orders of \$300 and over, costs ranged from 0.88 cent per dollar of sales for delivery in rural areas to 0.27 cent per dollar of sales for delivery in urban areas.

If the average delivery cost of 2.22 cents per dollar of sales shown in the 1954 report is applied to the average wholesale selling price of nonfat dry milk in December 1958--38.5 cents a pound--delivery costs would have averaged 0.85 cent per pound of product for all sizes of order and all delivery distances.

Wholesalers' Selling Prices

Wholesalers sell instant nonfat dry milk to buyers in case lots. Prices vary among brands of product sold, but more importantly they seem to vary in accordance with the pricing policies of individual wholesale firms.

Pricing practices of wholesalers responding to the questionnaire differ widely, frequently even among those located in the same city. Some firms operate on a "cost plus" basis, and price dry groceries, including nonfat dry milk, at cost plus either a flat or a graduated percentage markup. Others use a sliding scale method of pricing and vary their prices to buyers in accordance with the size of their orders. Still others set their prices by charging all buyers both a service fee, which varies by size of order, and a delivery fee, which varies both by size of order and by delivery distance.

The average wholesale selling price per pound for nonfat dry milk in five popular sizes of package in four major sales areas in December 1958 is shown in table 8.

Table 8.--Average wholesale selling prices per pound of instant nonfat dry milk, by sales area and size of package, December 1958 ^{1/}

Sales area	Average selling price per pound for--				
	3-quart package	4-quart package	5-quart package	8-quart package	12-quart package
	Cents	Cents	Cents	Cents	Cents
Northeastern	42.0	38.4	^{2/}	37.6	33.5
North Central	41.5	38.5	35.8	37.4	32.9
Southern	42.8	^{2/}	^{2/}	39.0	34.0
Western	41.2	38.1	36.4	37.4	33.1
Average, all areas ^{3/}	41.8	38.4	35.8	37.7	33.3

^{1/} Average of selling prices reported by wholesalers in response to questionnaire. In some cities, f.o.b. and delivered prices were averaged.

^{2/} Data omitted in order that confidential information would not be revealed.

^{3/} Includes data omitted from averages for individual areas.

For most sizes of package, the price per pound decreased as the size of package increased, except that the price for nonfat dry milk packed in the 8-quart package was higher than that in the 5-quart package. In one city the price differential was 5.1 cents and in another 5.6 cents a pound. In the remaining cities the differential ranged between 0.4 and 2.3 cents. A price differential on the 8-quart package might be expected inasmuch as the price per pound paid by the wholesaler for this size was higher than the price for the 5-quart package (table 6).

Wholesalers in the South reported the highest average selling prices per pound of nonfat dry milk in all sizes of package. Western wholesalers reported the lowest prices for the 3- and 4-quart packages; firms in the North Central and Western sales areas reported the lowest price for the 8-quart size; and firms in the North Central area reported the lowest price for both the 5- and the 12-quart packages.

Table 9 shows the range in wholesale selling prices for different sizes of package of nonfat dry milk in four sales areas. For several sizes, the range both within and among sales areas was wide. For all areas, the greatest price range--6.0 cents per pound--was shown for the 5- and 8-quart packages, while the narrowest range--1.8 cents per pound--was shown for the 4-quart package.

Table 9.--Range in wholesale selling prices per pound of instant nonfat dry milk, by sales area and by size of package, December 1958 ^{1/}

Sales area	Range in selling prices per pound for --				
	3-quart package	4-quart package	5-quart package	8-quart package	12-quart package
	Cents	Cents	Cents	Cents	Cents
Northeastern	40.8-43.1	37.8-39.1	2/	36.7-38.5	32.6-33.9
North Central	40.1-44.1	37.4-39.1	31.3-37.3	36.4-38.3	31.3-33.9
Southern	41.3-44.1	2/	2/	37.5-42.4	33.0-35.1
Western	40.1-41.8	37.3-39.0	35.6-37.1	36.5-38.0	32.4-33.8
All areas ...	40.1-44.1	37.3-39.1	31.3-37.3	36.4-42.4	31.3-35.1

^{1/} As shown in wholesalers' replies to questionnaire.

^{2/} Data omitted in order that confidential information would not be revealed.

Among individual sales areas, the widest range in wholesale selling prices was shown in the North Central area for the 3-, 5-, and 12-quart packages, in the West for the 4-quart package, and in the South for the 8-quart package. The narrowest price range, on the other hand, was shown in the Western sales area for 3-, 5-, and 8-quart packages, and in the Northeastern area for both the 4- and 12-quart packages.

The weighted average wholesale selling price ^{15/} per pound of nonfat dry milk in five sizes of package was 38.5 cents in December 1958.

Wholesalers' Margins

Wholesale margins in December 1958 on a pound of instant nonfat dry milk are shown for four sales areas in table 10. With but one exception--the 8-quart package--wholesale margins tend to narrow as the size of package increases.

Wholesalers in the South had the widest gross margins on the three package sizes they reported. Firms in the North Central sales area had the narrowest margins on the 3-, 4-, 8-, and 12-quart sizes, while those in both the North Central and Western areas had the narrowest and identical margins on the 5-quart size.

^{15/} Weighted by wholesalers' estimates of their sales by size of package in December 1958.

Table 10.--Average gross wholesale margins per pound of instant nonfat dry milk, by sales area and by size of package, December 1958 ^{1/}

Sales area	Average margin per pound for--				
	3-quart package	4-quart package	5-quart package	8-quart package	12-quart package
	<u>Cents</u>	<u>Cents</u>	<u>Cents</u>	<u>Cents</u>	<u>Cents</u>
Northeastern	3.0	2.3	<u>2/</u>	2.2	2.0
North Central	2.3	2.0	1.9	1.9	1.3
Southern	3.6	<u>2/</u>	<u>2/</u>	3.2	2.3
Western	2.4	2.8	1.9	2.1	1.8
Average, all areas	2.7	2.4	1.7	2.2	1.8

^{1/} Computed from data in tables 4 and 6.

^{2/} Data omitted in order that confidential information would not be revealed.

The magnitude of the variation in the average gross margins of wholesalers is illustrated by table 11. This table shows the range in gross margins, by size of package in the four sales areas. As shown, gross wholesale margins in December 1958 ranged from 0.4 cent a pound for nonfat dry milk packed in 12-quart packages to 5.1 cents a pound for that packed in the 4-quart size.

Table 11.--Range in gross wholesale margins per pound of instant nonfat dry milk by sales area and by size of package, December 1958 ^{1/}

Sales area	Range in margin per pound for--				
	3-quart package	4-quart package	5-quart package	8-quart package	12-quart package
	<u>Cents</u>	<u>Cents</u>	<u>Cents</u>	<u>Cents</u>	<u>Cents</u>
Northeastern	1.8-3.8	1.5-3.1	<u>2/</u>	1.2-3.2	1.1-2.7
North Central	1.7-4.1	1.4-2.9	1.0-3.1	.5-3.1	.4-2.8
Southern	3.0-4.9	<u>2/</u>	<u>2/</u>	2.7-4.1	2.2-2.5
Western	2.1-2.5	1.8-5.1	1.6-2.2	1.9-2.3	1.6-2.1
All areas ...	1.8-4.9	1.4-5.1	1.0-3.1	0.5-4.1	0.4-2.8

^{1/} Computed from information supplied by wholesalers in reply to questionnaire.

^{2/} Data omitted in order that confidential information would not be revealed.

For all areas, the greatest range in gross wholesale margins is shown for the 4-quart package, the narrowest for the 5-quart package. In general, the widest range in gross margins is shown in the North Central area, the narrowest in the West.

The difference between wholesalers' weighted average buying and selling prices per pound of instant nonfat dry milk--their gross margins--was 2.4 cents in December 1958.

RETAILING COSTS AND MARGINS

Gross retail margins for instant nonfat dry milk are measured by the difference between the price paid by the retailer and the price paid by consumers. Marketing services performed by retailers include buying, storing, transporting, handling, and distributing.

Gross margins of retailers vary, largely in accordance with the pricing policies of individual retail firms. In addition, they tend to vary somewhat according to type of retail outlet, brand of product, and size and type of package handled.

Information obtained in this study shows that in 18 cities the gross retail margin on instant nonfat dry milk sold in five popular sizes of package averaged 8.7 cents per pound in December 1958.

Retailers' Costs

Because their customers make frequent small purchases, the small independent retailers as a rule stock only a few brands of instant nonfat dry milk. These are usually well-known brands, packed in small packages. Customers of the larger independent and chain supermarkets tend to shop less frequently and to buy in larger volume. These markets, therefore, stock nonfat dry milk in a variety of brands and package sizes. And, as has been mentioned, many chain-stores feature nonfat dry milk packaged under their own labels.

Small independent retailers purchase nonfat dry milk from local wholesalers, often on a cash-and-carry basis.

Independent retailers sometimes buy through brokers who arrange to have the nonfat dry milk picked up from local stocks and delivered to retail stores at the sellers' expense. In some areas, however, it is becoming common for independent retailers to pool their orders and to buy from wholesalers on a cooperative basis.

Retail food chains frequently purchase nonfat dry milk in large enough volume so that it is shipped in carlots direct to their warehouses by processors or distributors. A few buy through brokers. Some purchase from wholesalers who deliver. And some prefer to pick up merchandise at wholesalers' docks and transport it to their warehouses or stores in their own vehicles.

Retailing costs of food marketing concerns vary widely according to the size and type of their businesses, the number and type of customer services they provide, and the efficiency with which they operate their businesses. Some buy and sell only; some buy, sell, and deliver; others buy, warehouse, and sell; and still others buy, warehouse, sell, and deliver. All incur capital, labor, and management costs in varying amounts for buying, handling, and selling operations.

Selling costs of retail firms, including food marketing firms, have been studied in recent years. It was not possible, however, to determine from published data a selling cost figure which would be representative of costs incurred by the hundreds of neighborhood grocery stores, delicatessens, specialty food stores, supermarkets, and chainstores which sell instant nonfat dry milk. Neither was it feasible, because of the number and variety of establishments selling nonfat dry milk for home use, to attempt to obtain comprehensive cost information direct from individual retailers for use in this study.

Buying

Retailers who purchased nonfat dry milk from wholesalers--usually independent firms--paid from 33.3 to 41.8 cents a pound, depending upon brand and size of package, in December 1958 (table 8). Although small retailers are likely to pay somewhat more for nonfat dry milk purchased from wholesalers than those who buy in volume, the average prices shown are considered to be within the range of the prices paid by both large and small firms. As has been shown, the weighted average wholesale selling price for five popular sizes of retail packages was 38.5 cents per pound in December 1958. 16/

Storage

Pending delivery to their retail markets, retailers who purchase instant nonfat dry milk direct from distributors store the product in their own warehouses. Storage costs incurred depend upon the volume of product stored, the length of the storage period, and the amount of handling required. Costs to retailers who do their own warehousing were not ascertained. Because these retailers perform the equivalent of the wholesaling function, however, it is likely that their warehousing costs are within range of the costs reported by food wholesalers.

Local Hauling

Local hauling costs are incurred by retailers who pick up their merchandise in their own or hired vehicles for delivery either to a warehouse for temporary storage, or to a retail store. Costs vary depending upon frequency of trips, size of load, type and size of vehicle used, number of personnel employed in the operation, and length of haul.

16/ Weighted on the basis of wholesalers' estimates of their sales by size of package in December 1958.

Hauling operations of chainstores and other retail food outlets which move merchandise from warehouses to scattered store locations are similar to the operations of regular food wholesalers. Their hauling costs might be expected, therefore, to be in line with those of wholesalers. Delivery costs of wholesalers were discussed above, beginning on page 32.

Selling

Nonfat dry milk handled by retail food stores must be price-marked when it is received, placed on shelves, sometimes repriced, and sacked for customers. Some, particularly the small independent markets, deliver customers' purchases. Some extend credit to certain customers. Larger food markets, on the other hand, sell on a cash-and-carry basis, and thus eliminate the expense of delivery, credit extension, and loss from nonpayment of accounts.

Retailers' Selling Prices

Retail prices of instant nonfat dry milk in 20 cities have been collected monthly since February 1957 by the BLS for the AMS, as explained on page 2. Average prices for the best-selling size of package in each of the 20 cities are computed separately for two groups of stores--chain and large independent, and small independent. The two average prices are then weighted together on the basis of the estimated percentage of total food sales made by each group in each city.

Table 12 shows for each of the cities surveyed and for all the cities combined, the average retail price per pound of instant nonfat dry milk for the 12-month periods ended January 1958, 1959, and 1960, and for the entire 36-month period ended January 1960.

Although there was some price variation even among cities within the same sales area during the period studied, most of the price differences were narrow. Prices in several cities, however, were sufficiently at variance with average prices in other cities within the same sales area and with the 20-city average price to warrant special attention.

Among all the cities surveyed, Kansas City, Mo., consistently reported the lowest average price throughout the entire 36-month pricing period.

A review of data showed that wholesalers in Kansas City were buying nonfat dry milk at prices almost identical with prices paid by other wholesalers in the North Central sales area. Margins taken by wholesalers on several sizes of packages were, however, significantly below those reported by wholesalers in other cities in the area, and below the weighted average margins taken by wholesalers on all sizes of packages in all areas.

However, because the level of wholesale selling prices did not seem to explain fully the wide price differential in Kansas City, a check of 15 retail food stores in the city was made in the winter of 1959. The survey revealed that two factors in addition to the wholesale price advantage could have contributed to the retail price situation.

Table 12.--Average retail price of instant nonfat dry milk in 20 cities, by sales areas, for 12-month periods ended January 1958, 1959, 1960, and 36-month period ended January 1960 ^{1/}

Sales area	Average retail price per pound for--			
	12-month period ended January 1958	12-month period ended January 1959	12-month period ended January 1960	36-month period ended January 1960
	Cents	Cents	Cents	Cents
Northeastern:				
Boston	46.1	46.0	46.9	45.8
New York City	45.8	47.2	47.9	46.9
Philadelphia	46.8	48.3	48.4	47.9
Pittsburgh	45.8	46.6	46.7	46.4
Scranton	46.4	46.7	46.8	46.6
Average	46.2	47.0	47.3	46.7
North Central:				
Chicago	46.2	47.4	47.7	47.1
Cincinnati	48.1	48.3	47.9	48.1
Cleveland	48.0	46.8	47.9	47.6
Detroit	44.4	47.6	50.5	47.5
Kansas City, Mo. ...	38.9	41.6	42.3	40.9
Minneapolis-St. Paul	50.3	49.7	48.7	49.6
St. Louis	43.3	45.3	45.4	44.7
Average	45.6	46.7	47.2	46.5
Southern:				
Atlanta	46.4	46.9	47.1	46.8
Baltimore	44.3	47.5	47.7	46.5
Houston	46.9	46.3	45.6	46.3
Washington, D. C. ..	50.2	49.2	49.5	49.6
Average	46.9	47.5	47.5	47.3
Western:				
Los Angeles	47.4	48.2	48.1	47.9
Portland, Oreg.	44.0	45.2	44.8	44.7
San Francisco	49.6	49.6	52.1	50.4
Seattle	47.2	46.5	44.7	46.2
Average	47.1	47.4	47.4	47.3
20-city average ..	46.3	47.1	47.3	46.9

^{1/} Computed from monthly retail price data collected for AMS by BLS.

In the first place, the survey revealed that in addition to the five sizes available generally in other cities, both a 10- and a 14-quart size package were being sold in many of the Kansas City food stores visited. The price of nonfat dry milk per pound in these package sizes is lower than that in smaller packages.

It was also found that certain competing milk products were available in the Kansas City food markets visited which are not generally available in all cities for which retail prices of nonfat dry milk were obtained. Among them were such items as regular and vitamin fluid skim milk in bottles, filled milk, and canned evaporated skim milk. All were selling at prices competitive with nonfat dry milk. Moreover, most stores visited stocked a variety of brands of instant nonfat dry milk.

It was concluded, therefore, that the lower retail price in Kansas City resulted from a combination of three factors--lower wholesale prices, availability of competing and substitute products, and availability of a variety of large packages of nonfat dry milk.

Retail prices of instant nonfat dry milk in the Minneapolis-St. Paul market were higher than those reported in most other markets during much of the period for which retail prices were obtained (table 12). The high level of prices was questioned inasmuch as the market is located in the heart of a major production area for nonfat dry milk.

Neither processors' nor wholesalers' selling prices in the market appeared to be out of line with those of other cities either within or outside the North Central sales area. Discussion with persons familiar with the market situation revealed, however, that because the price of fluid whole milk has been low for some time (24), the demand for nonfat dry milk for home use has not been strong. Retailers who are willing to stock this slow-moving product apparently price it high enough to compensate them for the valuable shelf space it occupies in their stores.

Higher than average retail prices were likewise reported in Detroit, particularly in the latter months of the 3-year period studied, and in San Francisco and Washington, D. C., throughout most of the period (table 12).

Sales of instant nonfat dry milk in small packages increased noticeably in Detroit beginning about the middle of 1958 and continuing throughout the remaining months of the 36-month period studied. This factor doubtless accounts in part for the high retail price level in that city.

BLS retail prices of instant nonfat dry milk are obtained from food stores located within the central city only. In both San Francisco and Washington, D. C., a large proportion of central city residents live in apartments or other small quarters. Their cooking facilities and home food storage space are limited. Many are single persons who take meals regularly away from home. Consequently, they buy at one time only small quantities of food, including dry milk, for home use. The price of nonfat dry milk per pound is higher in small than in large packages. Hence, the average retail prices reported for nonfat dry milk in these two cities are heavily weighted by the prices paid by consumers who buy the product in small packages.

As has been shown, retailers were buying instant nonfat dry milk from wholesalers in December 1958 at delivered prices ranging between 33.3 and 41.8 cents a pound, depending upon the size of package (table 8), and averaging 38.5 cents.

According to BLS data, nonfat dry milk in 3-quart packages was sold in 18 cities in December 1958 at an average price of 51.4 cents a pound. ^{17/} That in 4-quart packages was sold at an average price of 45.6 cents a pound, while that in 5-quart packages was sold at an average price of 43.3 cents a pound. The retail price of instant nonfat dry milk in the five popular retail-size packages in 18 cities averaged 47.2 cents in December 1958 (table 13). ^{18/}

Table 13.--Average retail price of instant nonfat dry milk per pound, by sales areas, December 1958

Sales area	Average retail price per pound ^{1/}
	<u>Cents</u>
Northeastern ^{2/}	47.3
North Central ^{3/}	46.9
Southern ^{4/}	48.0
Western ^{4/}	46.9
Average, all areas	47.2

^{1/} Computed from retail price data collected in selected cities by BLS for AMS.

^{2/} Includes 3 cities only.

^{3/} Includes 7 cities.

^{4/} Includes 4 cities.

Retailers' Margins

On the basis of the retail-selling prices shown above, gross retail margins on 3-, 4-, and 5-quart packages of nonfat dry milk ranged from 7.2 to 9.6 cents a pound in 18 cities in December 1958 (table 14). Gross retail margins on instant nonfat dry milk sold in all five popular sizes of packages in 18 cities averaged 8.7 cents a pound in December 1958.

^{17/} Retail price data for Boston and Scranton were omitted from the analysis because prices were not obtained from wholesalers in these cities.

^{18/} A pound of instant nonfat dry milk is the equivalent of 5 quarts of fluid skim milk.

Table 14.--Average gross retail margins per pound in 18 cities on instant non-fat dry milk purchased from wholesalers, by size of package, December 1958.

Size of package	Average retail selling price per pound <u>1/</u>	Average retail buying price per pound <u>2/</u>	Average gross retail margin per pound
	<u>Cents</u>	<u>Cents</u>	<u>Cents</u>
3-quart	51.4	41.8	9.6
4-quart	45.6	38.4	7.2
5-quart	43.3	35.8	7.5

1/ As determined by BLS for 18 cities.

2/ Data from table 8.

FARM-TO-RETAIL PRICE SPREADS

Farm-to-retail price spreads on nonfat dry milk for household use widened during the 3 years 1957-59. During the 12 months ended January 1958, the spread averaged 37.7 cents (table 15). Over the 12-month period ended January 1959, the spread averaged 39.7 cents. During the 12 months ended January 1960, the average was 40.1 cents. For the entire 36-month period ended January 1960, the farm-to-retail price spread averaged 39.2 cents per pound.

A breakdown of the farm-to-retail price spread per pound of nonfat dry milk at each stage of the marketing process was determined for 1 month, December 1958, as shown in the following tabulation:

	<u>Cents per pound</u>
Price paid by consumer	47.2
Price paid by retailer	38.5
Retail spread	8.7
Price paid by wholesaler	36.1
Wholesale spread	2.4
Price paid by distributor	13.7
Distributing spread	22.4
Price paid by manufacturer	6.9
Manufacturing spread	6.8
Total price spread	<u>40.3</u>

The farm-to-retail price spread per pound of instant nonfat dry milk was 40.3 cents in December 1958. In the same month, however, the net farm value of the skim milk equivalent of a pound of nonfat dry milk--6.9 cents--was only 0.2 cent above the lowest value recorded during the entire 36-month period ended January 1960 (table 15). On the other hand, the average retail price of instant nonfat dry milk in December 1958--47.2 cents a pound--was only 0.4 cent below the highest price recorded during the 36-month period ended January 1960 (table 15).

Table 15.--Farm-to-retail price spreads on nonfat dry milk, by months, February 1957-January 1960

Month	: Net farm value of : skim milk equivalent : of 1 pound nonfat : dry milk 1/	: Processors' average : f.o.b. selling price : per pound in bulk 1/	: Average retail price : of instant nonfat : dry milk 2/	: Farm-to-retail : price spread
	Cents	Cents	Cents	Cents
1957:				
February	8.6	15.5	44.2	35.6
March	8.7	15.5	43.8	35.1
April	8.7	15.5	44.5	35.8
May	8.6	15.5	45.6	37.0
June	8.6	15.5	46.6	38.0
July	8.5	15.4	47.0	38.5
August	8.6	15.5	47.0	38.4
September	8.4	15.5	47.2	38.8
October	8.5	15.4	47.3	38.8
November	8.6	15.5	47.6	39.0
December	8.7	15.5	47.5	38.8
1958:				
January	8.7	15.5	47.3	38.6
12-month average:	8.6	15.5	46.3	37.7
February	8.7	15.4	47.0	38.3
March	8.5	15.3	47.0	38.5
April	7.5	14.3	47.0	39.5
May	7.2	13.9	46.9	39.7
June	7.1	13.8	47.0	39.9
July	7.1	13.8	47.0	39.9
August	7.1	13.8	47.0	39.9
September	6.8	13.8	47.1	40.3
October	7.1	13.8	47.2	40.1
November	7.2	13.8	47.3	40.1
December	6.9	13.7	47.2	40.3
1959:				
January	7.2	13.7	47.0	39.8
12-month average:	7.4	14.1	47.1	39.7
February	7.2	13.7	47.0	39.8
March	7.2	13.7	47.1	39.9
April	7.1	13.7	47.4	40.3
May	7.1	13.7	47.3	40.2
June	7.1	13.7	47.3	40.2
July	7.1	13.7	47.4	40.3
August	6.9	13.6	47.5	40.6
September	6.8	13.7	47.5	40.7
October	6.7	13.7	47.3	40.6
November	7.0	13.8	47.4	40.4
December	7.1	13.8	47.0	39.9
1960:				
January	7.5	13.8	47.6	40.1
12-month average:	7.1	13.7	47.3	40.2
36-month average:	7.7	14.4	46.9	39.2

1/ Data from table 4.

2/ Data from BLS.

Distribution of the consumer's dollar spent for instant nonfat dry milk in December 1958 is shown in table 16.

Table 16.--Distribution of the consumer's dollar spent for instant nonfat dry milk in December 1958

Marketing services	Share of consumer's dollar
	<u>Percent</u>
Producing and delivering raw material	15
Processing	14
Instantizing, packaging, advertising, and distributing	48
Wholesaling	5
Retailing	18
Total	100

The farmer received 15 percent of the consumer's dollar for producing and delivering to drying plants the skim milk equivalent of a dollar's worth of nonfat dry milk. His share in December 1958 was 3 percentage points less than the share he received a year earlier (table 17). Over the 36-month period ended January 1960, the farmer's share of the consumer's dollar spent for nonfat dry milk declined from 19 to 16 percent.

The 14 percent shown in table 17 as the share of the consumer's dollar going for processing, represents the gross return to processors for manufacturing the nonfat dry milk, packaging it in bulk, and distributing it to buyers.

Forty-eight percent of the consumer's dollar was the gross return received by distributors in December 1958 for instantizing and packaging nonfat dry milk in retail packages, promoting its sale, and selling and distributing it to wholesalers or other buyers.

Wholesalers received a gross return of 5 percent of every dollar spent by consumers for nonfat dry milk in December 1958 for marketing services performed--buying the packaged product from distributors, storing, selling, and distributing it to retailers.

Eighteen percent of the consumer's dollar went to retailers in December 1958 as their gross return for buying nonfat dry milk from wholesalers, and for selling and distributing it to consumers.

It is apparent, therefore, that of every dollar spent by consumers for instant nonfat dry milk, the share for marketing services performed at the level between the processor and the wholesaler--instantizing, packaging, advertising, and distributing--is by far the largest of any of the individual shares.

Table 17.--Farmer's share of consumer's dollar spent for instant nonfat dry milk, by months, February 1957-January 1960

Year and month	Farmer's share <u>1/</u>
	Percent
<u>1957:</u>	
February	19
March	20
April	19
May	19
June	18
July	18
August	18
September	18
October	18
November	18
December	18
<u>1958:</u>	
January	18
12-month average	19
February	18
March	18
April	16
May	15
June	15
July	15
August	15
September	14
October	15
November	15
December	15
<u>1959:</u>	
January	15
12-month average	16
February	15
March	15
April	15
May	15
June	15
July	15
August	15
September	14
October	14
November	15
December	15
<u>1960:</u>	
January	16
12-month average	15
36-month average	17

1/ Computed from data in table 15.

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